PHOTOGRAPHIC DETERMINATION OF THE POSITIONS OF STARS AND NEBULOUS KNOTS IN THE REGION OF THE GREAT NEBULA OF ANDROMEDA

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A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in the
University of Michigan

— BY —
JULIA M. HAWKES

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PHOTOGRAPHIC DETERMINATION OF THE POSITIONS OF STARS AND NEBULOUS KNOTS IN THE REGION OF THE GREAT NEBULA OF ANDROMEDA[1]

By JULIA M. HAWKES

INTRODUCTION

This study of the faint stars situated within the region of the Andromeda nebula was made for the purpose of determining their relative positions for two dates separated by an interval of sixteen years and for examining these positions for evidence of systematic movement which might be attributed to the relationships of these stars to the nebular forms. The study is based primarily on two photographs, taken with an interval of sixteen years, one on four nights in October, 1899, with a total exposure of nearly twelve hours, and the other on four nights in November, 1915, with a total exposure of ten hours and fifty-one minutes. These photographs were made at Northfield, Minnesota, by Professor H. C. Wilson, with the eight and one-half inch photographic refractor of the Goodsell Observatory. They were supplemented by thirteen others of shorter exposure, of this and other regions of the sky, taken with the same instrument, seven by Professor Wilson and six by the writer. These shorter exposures were used for the determination of the relative positions of a selected list of forty-eight comparison stars, and for the determination of the magnitudes of the stars measured. Eight catalogued stars situated within the region photographed were used as a basis for the determination of the coordinates of the forty-eight comparison stars. In addition to the forty-eight comparison stars, whose right ascensions and declinations for the epoch 1900 are given, the relative positions of 1222 faint stars within the limits of the nebula have been measured and are given by means of their rectangular coordinates.

[1] A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the University of Michigan.

THE PHOTOGRAPHIC TELESCOPE

The photographic telescope of the Goodsell Observatory was originally made in 1878 for visual observations by Alvan Clark and Sons, of Cambridgeport, Massachusetts. It has a clear aperture of eight and one-half inches and a focal length of ten and one-half feet. In 1887 the Clarks furnished a third lens of the same aperture, which, when mounted in front of the visual objective, converted it into a photographic objective with a focal length of one hundred and seven inches. This gives a photographic field two degrees in diameter on a plate four by five inches. The images show very little distortion, even at the extreme edge of the field.

A five-inch guiding telescope of the same focal length as the photographic triplet is attached to the telescope tube, and to it is fitted the micrometer of the original visual telescope. It has a reticle consisting of four spider threads, set so as to form a diamond shaped figure, approximately two minutes of arc on a side. The threads are illuminated by a small electric lamp of two-candle power. The magnifying power used in guiding was about three hundred.

THE NEGATIVES

The accompanying table (Table 1) gives a list of the negatives used in this study, with dates and durations of exposures, the positions of the center of the plates, observers, notes, etc. Seed plates were used: those of sensitometer 26 in 1896 and 1899, and of sensitometer 27 in 1915 and later years. A hydrochinon developer was used for all plates, made up as follows:

A	Water	30 oz.
	Hydrochinon	½ oz.
	Potassium bromide	¼ oz.
	Sodium sulphite (desiccated)	1½ oz.
B	Water	30 oz.
	Caustic potash	1 oz.

Use three parts of A to one of B.

Four exposures were made on plates VII and VIII. For these exposures the telescope was set to place the guiding star successively at each corner of the diamond formed by the intersecting threads of the reticle. Plate XV, of the Pleiades, taken for magnitude studies, also has a number of exposures. All of the other plates have a single exposure. For the long exposures, Plates III and V, it was necessary to continue the exposures on successive nights. The plate holder was left in position in the telescope, carefully protected from light during the intervening time, and the work continued from night to night under as nearly the same conditions as possible.

THE MEASURING ENGINE

The plates were measured by the writer at the Goodsell Observatory with a measuring engine constructed in 1913, by William Gaertner and Company of Chicago. This engine has two screws at right angles to each other, each with a pitch of one-half of a millimeter. The heads of the screws are three and one-half inches in diameter, divided into five hundred parts. The scale of the plates made with the eight and one-half inch telescope is such that one revolution of the screw corresponds very nearly to 37″.9. By reading the graduated head to the nearest half division, as was the custom, measures were obtained to one one-thousandth of a revolution of the screw, or approximately to 0″.04. Single bisections of the star images on these plates cannot be made closer than this.

The plate carriage is mounted on ways at right angles to each other and parallel to the measuring screws. The plate carriage can be rotated through any angle and clamped in any position. Its position is determined by a graduated circle, read by opposite verniers to 0°.01.

In September, 1913, Professor H. C. Wilson compared the horizontal screw with the B scale of the Repsold measuring engine belonging to the University of Minnesota. The average error of division, taken without regard to sign, was 0.0009 mm., or 0″.068; and at only one place was an error found which was greater than 0.0030 mm. The errors of the vertical screw have not been investigated, but they have been assumed to be of the same order of magnitude as those of the horizontal screw.

COMPARISON STARS

The comparison stars used in this investigation were selected on account of having good images and a fairly uniform distribution on the plates. They range in magnitude from 7.3 to 11.5. In the beginning fifty stars were selected, but two were rejected on account of being near the edge of the field of view.

Table 2 gives the mean places of the comparison stars for 1900.0. The right ascensions and declinations of this table were calculated from the final values of the rectangular coordinates of the stars, obtained from measurements of their positions on Plates I to VIII inclusive, with reductions and adjustments by the method of least squares. The right ascensions and declinations are based upon the catalogued places of eight of these stars; namely, those numbered 18, 22, 25, 29, 38, 41, 42, and 47. In the course of the determination of the positions of the forty-eight comparison stars, the places of the eight catalogued stars were also adjusted.

The places of the catalogued stars for the epoch 1900.0, as derived from the catalogues and as used in the preliminary computations of their rectangular coordinates, are given in Table 3. In forming these places proper motions for stars 22 and 47 were applied as follows:

For star 22, $\mu = -0^{s}.0016$, $\mu' = -0''.048$,
For star 47, $\mu = +0.0072$, $\mu' = -0.067$.

These proper motions were also applied to obtain corrected positions of these stars for the epochs of the plates.

The measures of stars 25 and 29 showed them also to have appreciable proper motions, but since the catalogued positions were not sufficient to determine them, these stars were not used in the preliminary solutions.

TABLE 1

LIST OF PLATES

NO.	CAT. NO.	OBS.	DATE	EXPOSURE		CENTER OF PLATE		NOTES
				BEGAN	ENDED	R. A.	DECL.	
				h m s	h m s	h m s	° ′	
I	C129a	Wilson	1896, Aug. 6	19 17 46	20 17 56	0 37 3	+40 24	The times of exposure are Northfield Sidereal Times
II	C151a	Wilson	1899, Sept. 8	20 16 52	22 42 16	0 37 47	+40 28	
III	C152	Wilson	1899, Oct. 4	22 6 33	25 3 2	0 37 4	+40 37	
			5	19 58 50	24 59 39			
			6	22 22 52	25 3 18			
			7	20 1 7	21 21 20			
IV	L182	Hawkes	1915, Oct. 28	22 25 0	23 15 0	0 37 16	+40 37	
			29	21 15 0	21 45 0			
V	L185	Wilson	1915, Nov. 1	21 24 0	1 15 0	0 37 24	+40 37	
			2	21 22 0	21 28 0			
			3	21 32 0	1 15 0			
			4	21 21 0	0 32 0			
VI	L186	Hawkes	1915, Nov. 5	22 31 0	1 16 0	0 37 16	+40 37	
VII	L274	Wilson	1916, Oct. 31	0 41 0	0 46 0	0 37 16	+40 37	
				0 47 0	0 49 0			
				0 50 0	0 52 0			
				0 53 0	0 55 0			
VIII	L287	Wilson	1916, Nov. 5	1 1 0	1 6 0	0 37 17	+40 43	
				1 7 0	1 12 0			
				1 13 0	1 18 0			
				1 19 0	1 24 0			
IX	L275	Wilson	1916, Oct. 31	1 1 0	1 6 0		+90 0	Polar region
X	L297a	Wilson	1917, Feb. 17	7±				Andromeda Nebula and Polar region.
XI	L334	Hawkes	1917, Oct. 12	21 6 14	22 8 24	1 38 0	+40 55	
XII	L335	Hawkes	1917, Oct. 12	22 22 27	23 24 37	1 20 0	+45 0	Harvard Region B.
XIII	L346	Hawkes	1917, Nov. 14	23 18 19	23 23 20	0 38 12	+40 29	
				23 24 20	23 39 23			
				23 40 23	0 25 30			
XIV	L350	Hawkes	1917, Nov. 15	21 42 59	0 46 29	0 38 12	+40 29	
XV	L354	Wilson	1918, Feb. 18	7 18±				Pleiades. Exposures of 15^s, 30^s, 1^m, 2^m, 4^m, 8^m.

TABLE 2

MEAN PLACES FOR 1900.0 OF THE FORTY-EIGHT COMPARISON STARS

NO.	MAG.	R. A.	PREC.	DECL.	PREC.
		h m s	s	° ′ ″	″
1	11.4	0 33 22.02	+3.2381	+40 32 5.29	+19.835
2	9.2	0 33 35.10	3.2368	40 7 20.49	19.832
3	10.8	0 33 59.32	3.2398	40 17 31.94	19.827
4	10.9	0 34 0.03	3.2426	40 45 5.03	19.827
5	10.4	0 34 7.06	3.2415	40 28 58.05	19.825
6	11.0	0 34 23.95	+3.2460	+40 59 17.58	+19.821
7	11.4	0 34 29.39	3.2476	41 10 36.61	19.820
8	9.6	0 34 30.75	3.2414	40 8 4.57	19.820
9	9.8	0 34 30.90	3.2407	40 1 28.49	19.820
10	10.9	0 34 42.57	3.2469	40 53 21.68	19.817
11	10.6	0 34 44.29	+3.2483	+41 4 51.24	+19.817
12	10.6	0 34 46.23	3.2482	41 2 25.63	19.817
13	10.6	0 34 47.58	3.2464	40 43 50.76	19.816
14	10.6	0 34 57.45	3.2448	40 20 11.89	19.814
15	9.8	0 35 20.44	3.2443	39 57 36.55	19.809
16	11.2	0 35 26.29	+3.2517	+41 3 47.75	+19.808
17	10.9	0 35 28.80	3.2478	40 24 46.52	19.807
18	9.0	0 35 31.13	3.2528	41 10 56.01	19.807
19	11.2	0 35 38.87	3.2465	40 3 42.93	19.805
20	10.6	0 36 2.94	3.2532	40 49 16.58	19.799
21	11.2	0 36 16.53	+3.2525	+40 32 10.83	+19.796
22	7.3	0 36 34.82	3.2515	40 8 29.96	19.792
23	11.2	0 36 35.03	3.2550	40 40 58.17	19.792
24	10.6	0 37 0.32	3.2591	41 0 7.26	19.786
25	9.5	0 37 2.67	3.2554	40 24 24.25	19.786
26	10.6	0 37 3.50	+3.2569	+40 37 17.11	+19.785
27	11.2	0 37 5.74	3.2585	40 50 15.07	19.785
28	9.8	0 37 8.40	3.2599	40 1 21.85	19.784
29	9.3	0 37 10.42	3.2610	41 9 7.29	19.784
30	11.3	0 37 27.92	3.2558	40 8 29.05	19.780
31	9.4	0 37 31.89	+3.2542	+39 51 17.23	+19.779
32	9.8	0 37 46.54	3.2594	40 27 41.05	19.775
33	11.5	0 37 48.50	3.2613	40 43 38.70	19.775
34	11.4	0 38 4.77	3.2618	40 36 18.06	19.771
35	10.9	0 38 10.18	3.2605	40 21 23.45	19.769
36	10.2	0 38 11.47	+3.2639	+40 49 40.65	+19.769
37	10.6	0 38 13.37	3.2663	41 9 32.87	19.769
38	9.4	0 38 35.47	3.2672	41 1 24.30	19.763
39	9.3	0 38 37.30	3.2597	39 53 13.68	19.763
40	10.9	0 38 45.31	3.2635	40 21 51.75	19.761

TABLE 2

MEAN PLACES FOR 1900.0 OF THE FORTY-EIGHT COMPARISON STARS

CONTINUED

NO.	MAG.	R. A.	PREC.	DECL.	PREC.
		h m s	s	° ′ ″	″
41	9.7	0 38 48.82	+3.2623	+40 8 17.73	+19.760
42	9.1	0 39 9.06	3.2639	40 7 57.01	19.755
43	10.6	0 39 15.47	3.2665	40 30 36.49	19.753
44	9.4	0 39 18.86	3.2690	40 45 58.34	19.753
45	9.4	0 40 4.99	3.2756	41 8 55.22	19.741
46	9.8	0 40 14.40	+3.2754	+41 0 55.82	+19.739
47	8.0	0 40 33.71	3.2716	40 15 48.51	19.734
48	9.4	0 40 35.39	3.2770	40 59 23.60	19.733

TABLE 3

MEAN PLACES OF CATALOGUED STARS FOR THE EPOCH 1900.0

STAR	MAG.	R. A.	DECL.	AUTHORITY
		h m s	° ′ ″	
18	8.8	0 35 31.17	+41 10 56.3	Bonn A. G. Catal. 526.
22	6.9	0 36 34.83	40 8 29.8	Mean of Rad. 185; Rad. 185G; Bonn A. G. Catal. 542; Lund A. G. Catal. 270; Second Gr. 10 yr. Catal. 216; with proper motion applied.
25	9.0	0 37 2.13	40 24 25.5	Bonn A. G. Catal. 546.
29	8.8	0 37 10.81	41 9 7.6	Bonn A. G. Catal. 550.
38	8.9	0 38 35.51	41 1 23.0	Bonn A. G. Catal. 566.
41	8.6	0 38 48.88	40 8 17.6	Mean of Rad. 195; Rad. 195G; Bonn A. G. Catal. 572; Lund A. G. Catal. 286; Second Gr. 10 yr. Catal. 228.
42	7.4	0 39 9.13	40 7 56.8	Mean of Rad. 198; Rad. 198G; Bonn A. G. Catal. 576; Lund A. G. Catal. 287; Second Gr. 10 yr. Catal. 228.
47	7.5	0 40 33.66	+40 15 48.9	Mean of Rad. 203; Rad. 203G; Bonn A. G. Catal. 593; Lund A. G. Catal. 295; Second Gr. 10 yr. Catal. 238; Küstner 297; with proper motion applied.

STANDARD COORDINATES

The *standard coordinates* of a star for a given epoch, as defined by Professor Turner, are the rectangular coordinates which the star would have on an ideal plate, truly centered and oriented, and unaffected by refraction and aberration. Let X and Y be the standard coordinates of a star whose right ascension and declination are α and δ; and let α_0 and δ_0 be the right ascension and declination of the center of the plate. The relations which these quantities sustain to each other are expressed by Turner's rigorous formulæ, as follows:

$$\begin{aligned} \tan\theta &= \tan\delta \sec(\alpha - \alpha_0), \\ X &= \tan(\alpha - \alpha_0) \sec(\theta - \delta_0) \cos\theta, \\ Y &= \tan(\theta - \delta_0). \end{aligned} \qquad (1)$$

For finding α and δ from X and Y, when α_0 and δ_0 are also given, these equations are written in the following order,

$$\begin{aligned} \tan(\theta - \delta_0) &= Y, \\ \tan(\alpha - \alpha_0) &= X \cos(\theta - \delta_0) \sec\theta, \\ \tan\delta &= \tan\theta \cos(\alpha - \alpha_0). \end{aligned} \qquad (2)$$

By expanding equations (1) and (2), Professor Jacoby expressed the values of X and Y, and of $\Delta\alpha$ and $\Delta\delta$ in series, the first terms of which are as follows:

$$X = \cos\delta_0\,[\Delta\alpha - \Delta\alpha\,\Delta\delta\tan\delta_0\sin 1'' + \Delta\alpha^3\,(\tfrac{1}{3} - \tfrac{1}{2}\sin^2\delta_0)\sin^2 1'' + \ldots]$$
$$Y = \Delta\delta + \tfrac{1}{4}\,\Delta\alpha^2\sin 2\delta_0\sin 1'' + \tfrac{1}{2}\,\Delta\alpha^2\,\Delta\delta\cos 2\delta_0\sin^2 1'' + \tfrac{1}{3}\,\Delta\delta^3\sin^2 1'' - \ldots \qquad (3)$$

$$\Delta\alpha = X\sec\delta_0\,[1 + Y\tan\delta_0\sin 1'' + Y^2\tan^2\delta_0\sin^2 1'' + \ldots] - \tfrac{1}{3}\,X^3\sec^3\delta_0\sin^2 1'' + \ldots$$
$$\Delta\delta = Y - \tfrac{1}{4}\,(X\sec\delta_0)^2\sin 2\delta_0\sin 1'' - \tfrac{1}{2}\,Y\,(X\sec\delta_0)^2\sin^2 1'' - \tfrac{1}{3}\,Y^3\sin^2 1'' + \ldots \qquad (4)$$

in which $\Delta\alpha = \alpha - \alpha_0$ and $\Delta\delta = \delta - \delta_0$.

The standard coordinates of the six catalogued stars which were used in the first steps in the determination of the positions of the forty-eight comparison stars are given for the epoch 1900.0 in Table 4, and for the epoch 1916.0 in Table 5. These coordinates are referred to star 26 as the origin, using as its place, for 1900.0,

$$\alpha_0 = 0^h\,37^m\,3^s.50, \quad \delta_0 = +40^\circ\,37'\,16''.7.$$

They were computed by Jacoby's formulæ, and checked by the following modification of Turner's formulæ,

$$X = (\Delta\alpha + t)\cos\theta\sec(\theta - \delta_0),$$
$$Y = \tan(\theta - \delta_0) = (\theta - \delta_0) + \tfrac{1}{3}\,(\theta - \delta_0)^3\sin^2 1'' + \ldots$$
$$= (\theta - \delta_0) + t \qquad (5)$$

in which the value of t was taken from a small table having $(\theta - \delta_0)$ and $\Delta\alpha$ as arguments.

TABLE 4

COORDINATES FOR 1900.0 COMPUTED FROM CATALOGUED PLACES

STAR	X	Y	X'	Y'
	″	″	″	″
18	−1042.51	+2021.97	−1829.92	+2525.98
22	− 328.88	−1726.69	−1116.29	−1222.68
38	+1041.17	+1448.57	+ 253.76	+1952.58
41	+1208.40	−1736.21	+ 420.99	−1232.20
42	+1440.72	−1755.74	+ 653.31	−1251.73
47	+2405.54	−1275.95	+1618.13	− 771.94
Sums	+4724.44	−3024.05	+ 0.02	+ 0.01

$X_0 = +787''.41$
$Y_0 = -504''.01$

In Tables 4 and 5, X_0 is the mean of the X's, and Y_0 is the means of the Y's; and $X' = X - X_0$ and $Y' = Y - Y_0$, that is X_0 and Y_0 are the coordinates of the centroid of the group of stars, and X' and Y' are the coordinates of the stars referred to the centroid as an origin.

TABLE 5

COORDINATES FOR 1916.0 COMPUTED FROM CATALOGUED PLACES

STAR	X	Y	X'	Y'
	″	″	″	″
18	−1042.51	+2021.97	−1830.12	+2526.30
22	− 329.12	−1727.48	−1116.73	−1223.15
38	+1041.17	+1448.57	+ 253.56	+1952.90
41	+1208.40	−1736.21	+ 420.79	−1231.88
42	+1440.72	−1755.74	+ 653.11	−1251.41
47	+2406.99	−1277.06	+1619.38	− 772.73
Sums	+4725.65	−3025.95	+ 0.01	+ 0.03

$X_0 = +787''.61$
$Y_0 = -504''.33$

METHODS OF MEASUREMENT AND REDUCTION

In the beginning it was necessary to obtain reliable positions of the comparison stars by adjusting them to each other and to the places of the catalogued stars by the aid of measures of the plates. Plate VIII was chosen for the first measures, because it had four exposures and the clearest and sharpest images. It will be used as an example to illustrate the methods of measurement and reduction followed in this study.

The approximate position of the optical center of the plate, represented by star 26, was obtained by comparison with star 25. The measured differences of the rectangular coordinates of these

stars, when converted into differences of right ascension and declination, gave

$$\Delta\alpha = +1^{s}.37, \text{ and } \Delta\delta = +12'\ 51''.2,$$

by means of which we have

$$\alpha = 0^{h}\ 37^{m}\ 3^{s}.50, \quad \delta = +40^{\circ}\ 37'\ 16''.7,$$

as the corresponding position of star 26. This position was used as the center of the plates in the preliminary reductions. The final position of star 26, given in Table 2, is

$$\alpha = 0^{h}\ 37^{m}\ 3^{s}.50, \quad \delta = +40^{\circ}\ 37'\ 17''.11.$$

In succession the four images of star 26 on Plate VIII were first measured, both coordinates at the same time; then, similarly, the four images of each of the other comparison stars were measured; after which, to check the constancy of the position of the plate in the measuring engine, the measures of star 26 were repeated. This check was regarded as satisfactory when the last settings agreed with the first ones to within 0.010 of a revolution of the measuring screw. After measures had been made in this manner, the plate was reversed in the engine and the measures repeated. This was to avoid direct and reversed errors.

The eight readings on the central star were subtracted from the corresponding readings on the other stars, giving eight values of the coordinates of each star, the means of which were adopted as the *measured coordinates*, referred to star 26 as an origin. The signs were determined by comparison with those of the standard coordinates computed from the catalogued positions.

Let X and Y be the standard coordinates of a star computed from its right ascension and declination, and x and y its coordinates as measured on a plate. Then the relations between these coordinates are expressed by the equations

$$\begin{aligned} X &= a + bx + cy, \\ Y &= d + ex + fy, \end{aligned} \tag{6}$$

in which a, b, c, d, e, and f are the plate constants, which take account of all corrections which are linear, such as the first order terms of refraction and aberration; also scale value, orientation of plate in telescope and measuring engine, and non-perpendicularity of the two measured coordinates, as was shown by Professor H. H. Turner, in *The Monthly Notices of the Royal Astronomical Society*, Vol. 54, pp. 11-25, November 1893.

If the centroid of a group of stars be computed and their coordinates be referred to it as an origin, then the constants a and d of equations (6) will be zero, and the separate sums of the abscissas and the ordinates will also be zero. This condition affords a useful check upon the accuracy of the calculations; by arranging the abscissas and ordinates in columns, the algebraic sum of each column should be zero.

Let X_0 and Y_0 be the coordinates of the centroid of a group of stars found by taking the means of their standard coordinates, and x_0 and y_0 be the coordinates of the centroid of the same stars as found by taking the means of their coordinates measured on a plate. Then

$$\begin{aligned} X_0 &= a + bx_0 + cy_0, \\ Y_0 &= d + ex_0 + fy_0. \end{aligned} \tag{7}$$

Further, let x' and y' be the coordinates of the stars referred to the centroid derived from the measures as an origin, and X' and Y' the corresponding coordinates derived from the computed positions. Then

$$\begin{aligned} X' &= X - X_0, & Y' &= Y - Y_0, \\ x' &= x - x_0, & y' &= y - y_0, \end{aligned}$$

and the differences of the corresponding equations (6) and (7) give

$$\begin{aligned} X' &= bx' + cy', \\ Y' &= ex' + fy'. \end{aligned} \tag{8}$$

The scale of the plates used in this investigation is such that the coefficients b and f are each very nearly 37.9, and for convenience we may put

$$\begin{aligned} m &= X' - 37.9\,x', \\ n &= Y' - 37.9\,y', \end{aligned}$$

and equations (8) become

$$\begin{aligned} (b - 37.9)\,x' + cy' &= m, \\ ex' + (f - 37.9)\,y' &= n. \end{aligned} \tag{9}$$

The measures of each comparison star give two equations of condition of the forms (9), the solutions of which by the method of least squares give the most probable values of the constants b, c, e, and f.

The arrangement of the work, in the application of the above equations to the six catalogued stars which were used in the preliminary solutions, is shown in the accompanying tables.

Table 6 gives the coordinates of the six catalogued stars from measures of Plate VIII. In this table x_0 is the mean of the x's, and y_0 is the mean of the y's; and $x' = x - x_0$ and $y' = y - y_0$. Star 26 was taken as the origin, and, consequently, when the origin is transferred to the centroid of the measures, the coordinates of star 26 become $-x_0$, $-y_0$.

Equations of condition were formed corresponding to equations (9), using the values of x' and y' from columns four and five of Table 6 as coefficients and the corresponding values of m and n as known terms. The solution of these equations by the method of least squares gave the following values,

$$\begin{aligned} b - 37.9 &= +0''.020, & e &= +0''.0443, \\ c &= -0\ .010, & f - 37.9 &= +0\ .0157, \end{aligned}$$

The substitution of the values of b, c, e, f in the second members of equations (8) will give the values of X' and Y' of column five of Table 7. These values of X' and Y' may, however, be more readily found by adding the corrections given in columns three and four of Table 7 to the values of $37.9\,x'$ and $37.9\,y'$, given in the sixth and seventh columns of Table 6. The residuals given in the last column of Table 7 are the differences of the corresponding values of X' and Y' in Tables 5 and 7.

When the plate constants had been found from the six catalogued stars, in the manner indicated, they were used in the same way in the reduction of the measured coordinates, x and y, of the forty-two remaining comparison stars, to give their computed coordinates, X' and Y'.

The reductions given in Table 6 and 7 are expressed in seconds of arc. They may also be made in terms of revolutions of the measuring screw. For this reduction the constants already given in arc must be divided by 37.9, and a and d, which are the residuals of star 26 in Table 7, must be similarly expressed. The constants then become

$$\begin{aligned} a &= +0.0192, & d &= -0.0179, \\ b - 1 &= +0.000527, & f - 1 &= +0.000414, \\ c &= -0.000264, & e &= +0.001169. \end{aligned}$$

By writing equations (6) in the following forms,

$$\begin{aligned} X &= x + (b - 1)\,x + cy + a, \\ Y &= y + (f - 1)\,y + ex + d, \end{aligned} \qquad (10)$$

TABLE 6

COORDINATES OF SIX CATALOGUED STARS FROM MEASURES OF PLATE VIII

STAR	x	y	x'	y'	$37.9\,x'$	$37.9\,y'$	m	n
	r	r	r	r	"	"	"	"
18	−27.4981	+53.3640	−48.2455	+66.6716	−1828.50	+2526.85	−1.62	−0.55
22	− 8.7108	−45.5171	−29.4582	−32.2095	−1116.47	−1220.74	−0.26	−2.41
38	+27.4454	+38.1996	+ 6.6980	+51.5072	+ 253.85	+1952.12	−0.29	+0.78
41	+31.8339	−45.8224	+11.0865	−32.5148	+ 420.18	−1232.31	+0.61	+0.43
42	+37.9618	−46.3393	+17.2144	−33.0317	+ 652.43	−1251.90	+0.68	+0.49
47	+63.4524	−33.7305	+42.7050	−20.4229	+1618.52	− 774.03	+0.86	+1.30
Sums	+124.4846	−79.8457	− 0.0002	− 0.0001	+ 0.01	− 0.01	−0.02	+0.04

$x_0 = +20.7474$

$y_0 = -13.3076$

and using the constants just given, the corrections to x and y, given in columns three and four of Table 8 are readily obtained. The values of X and Y derived from the measures are given in the fifth column of this table, and those from the catalogued places of the stars in the sixth column, and the residuals in the last two columns. The results of this computation may be reduced to seconds of arc by multiplying by 37.9, since the corrections to this scale value have already been applied. The residuals in the last column are expressed in seconds of arc, and they agree with those given in Table 7.

The coordinates of all stars measured in this study were reduced in both ways, in seconds of arc and in revolutions of the measuring screw, to give a check upon the numerical work. The first steps of subtracting and averaging were checked by repetition.

When the reduction of Plate VIII was completed, the forty-eight comparison stars were next measured on Plates IV, V, VI, and VII, and reduced in the same manner as Plate VIII, by means of the same six catalogued stars. The weighted means of the coordinates from these five plates were used as standards for the year 1916.

Plates I, II, and III were then measured, and reduced by means of the same six catalogued stars, using their standard coordinates for 1900.0, as given in Table 4. A comparison of the results of these reductions with those from the other plates showed seven of the stars to have appreciable proper motions. These stars were omitted from the calculations until their proper motions could be determined. It was assumed that the proper motions of the remaining forty-one stars were negligible, or that the algebraical sum of

TABLE 7

REDUCTION OF COORDINATES TO CATALOGUED POSITIONS

STAR	$37.9\,x'$	$+.020\,x'$	$-.010\,y'$	COMPUTED X'	v
	″	″	″	″	″
18	−1828.50	−0.96	−0.67	−1830.13	−0.01
22	−1116.47	−0.59	+0.32	−1116.74	−0.01
38	+ 253.85	+0.13	−0.52	+ 253.46	−0.10
41	+ 420.18	+0.22	+0.33	+ 420.73	−0.06
42	+ 652.43	+0.34	+0.33	+ 653.10	−0.01
47	+1618.52	+0.85	+0.20	+1619.57	+0.19
26	− 786.33	−0.41	−0.13	− 786.87	+0.73

STAR	$37.9\,y'$	$+.0443\,x'$	$+.0157\,y'$	COMPUTED Y'	v
	″	″	″	″	″
18	+2526.85	−2.14	+1.05	+2525.76	−0.54
22	−1220.74	−1.30	−0.51	−1222.55	+0.60
38	+1952.12	+0.30	+0.81	+1953.23	+0.33
41	−1232.31	+0.49	−0.51	−1232.33	−0.45
42	−1251.90	+0.76	−0.52	−1251.66	−0.25
47	− 774.03	+1.89	−0.32	− 772.46	+0.27
26	+ 504.36	−0.92	+0.21	+ 503.65	−0.68

their proper motions might be regarded as zero. The places of the forty-one remaining stars were reduced to the epoch 1900.0. This was done by using the forty-one stars in a least squares solution. The two sets of plates were thus brought as close together as possible. After Plates III and V had been measured, the means of the repeated measures of the comparison stars on these plates were given some weight in establishing the adopted coordinates for the dates 1900.0 and 1916.0. These adopted rectangular coordinates are given in Tables 9 and 10, and as reduced to polar coordinates, in Table 2. The epoch 1900.0 was used.

TABLE 8
REDUCTION OF MEASURED COORDINATES IN REVOLUTIONS OF THE SCREW

STAR	x	$(b-1)\,x$	cy	MEASURED X	STANDARD X	v	v
							″
18	−27.4981	−0.0145	−0.0141	−27.5075	−27.5069	−0.0006	−0.02
22	− 8.7108	−0.0046	+0.0120	− 8.6842	− 8.6839	−0.0003	−0.01
38	+27.4454	+0.0145	−0.0101	+27.4690	+27.4715	−0.0025	−0.09
41	+31.8339	+0.0168	+0.0120	+31.8819	+31.8839	−0.0020	−0.08
42	+37.9618	+0.0200	+0.0122	+38.0132	+38.0137	−0.0005	−0.02
47	+63.4524	+0.0334	+0.0089	+63.5139	+63.5090	+0.0049	+0.19

STAR	y	$(f-1)\,y$	ex	MEASURED Y	STANDARD Y	v	v
							″
18	+53.3640	−0.0322	+0.0221	+53.3360	+53.3502	−0.0142	−0.54
22	−45.5171	−0.0102	−0.0188	−45.5640	−45.5799	+0.0159	+0.60
38	+38.1996	+0.0321	+0.0158	+38.2296	+38.2208	+0.0088	+0.33
41	−45.8224	+0.0372	−0.0190	−45.8221	−45.8103	−0.0118	−0.45
42	−46.3393	+0.0444	−0.0192	−46.3320	−46.3256	−0.0064	−0.24
47	−33.7305	+0.0742	−0.0140	−33.6882	−33.6955	+0.0073	+0.28

$a = +0.0192$, $d = -0.0179$.

TABLE 9
ADOPTED COORDINATES OF THE FORTY-EIGHT COMPARISON STARS FOR THE EPOCH 1900.0, FROM PLATES I, II, III

NO.	MAG.	X	Y	X''	Y''
		r	r	″	″
1	11.4	−66.6187	− 7.8731	−2524.85	− 298.39
2	9.2	−63.0700	−47.0807	−2390.35	−1784.36
3	10.8	−55.5997	−31.0150	−2107.23	−1175.47
4	10.9	−55.0296	+12.5932	−2085.62	+ 477.28
5	10.4	−53.1155	−12.9459	−2013.08	− 490.65
6	11.0	−47.6649	+35.0285	−1806.50	+1327.58
7	11.4	−45.9237	+52.9346	−1740.51	+2006.22
8	9.6	−46.2288	−46.0567	−1752.07	−1745.55
9	9.8	−46.2478	−56.5034	−1752.79	−2141.23
10	10.9	−42.1839	+25.6000	−1598.77	+ 970.24

TABLE 9

ADOPTED COORDINATES OF THE FORTY-EIGHT COMPARISON STARS FOR THE EPOCH 1900.0, FROM PLATES I, II, III — CONTINUED

NO.	MAG.	X	Y	X''	Y''
		r	r	$''$	$''$
11	10.6	−41.5409	+43.7826	−1574.40	+1659.36
12	10.6	−41.0541	+39.8982	−1555.95	+1512.14
13	10.6	−40.7499	+10.5311	−1544.42	+ 399.13
14	10.6	−38.0372	−26.9243	−1441.61	−1020.43
15	9.8	−31.3121	−62.7156	−1186.73	−2376.92
16	11.2	−29.0021	+42.0470	−1099.18	+1593.58
17	10.9	−28.5449	−19.7148	−1081.85	− 747.19
18	9.0	−27.5235	+53.3219	−1043.14	+2020.90
19	11.2	−25.6519	−53.0612	− 972.21	−2011.42
20	10.6	−18.1237	+19.0251	− 686.89	+ 721.25
21	11.2	−14.1356	− 8.0559	− 535.74	− 305.32
22	7.3	− 8.7021	−45.5206	− 329.81	−1725.23
23	11.2	− 8.5412	+ 5.8504	− 323.71	+ 221.73
24	10.6	− 0.9427	+36.1517	− 35.73	+1370.15
25	9.5	− 0.3177	−20.3623	− 12.04	− 771.73
26	10.6	+ 0.0129	− 0.0008	+ 0.49	− 0.03
27	11.2	+ 0.6575	+20.5486	+ 24.92	+ 778.79
28	9.8	+ 1.4847	−56.8432	+ 56.27	−2154.36
29	9.3	+ 2.1100	+50.4237	+ 79.97	+1911.06
30	11.3	+ 7.3794	−45.5646	+ 279.68	−1726.90
31	9.4	+ 8.6361	−72.7873	+ 327.31	−2758.64
32	9.8	+12.9619	−15.1892	+ 491.26	− 575.67
33	11.5	+13.4939	+10.0863	+ 511.42	+ 382.35
34	11.4	+18.4049	− 1.5237	+ 697.55	− 57.65
35	10.9	+20.0847	−25.1211	+ 761.20	− 952.09
36	10.2	+20.3644	+19.6488	+ 771.81	+ 744.49
37	10.6	+20.8329	+51.0773	+ 789.57	+1935.83
38	9.4	+27.4726	+38.2341	+1041.21	+1449.07
39	9.3	+28.4709	−69.6504	+1079.05	−2639.75
40	10.9	+30.7108	−24.3285	+1163.94	− 922.05
41	9.7	+31.8765	−45.8026	+1208.12	−1735.92
42	9.1	+37.9958	−46.3158	+1440.04	−1755.37
43	10.6	+39.7113	−10.4371	+1505.06	− 395.56
44	9.4	+40.5865	+13.8861	+1538.23	+ 526.28
45	9.4	+54.1367	+50.3000	+2051.78	+1906.36
46	9.8	+57.5602	−57.2639	+2181.53	−2170.30
47	8.0	+63.4314	−33.6443	+2404.05	−1275.12
48	9.4	+63.3219	+35.3198	+2399.90	+1338.62

TABLE 10

ADOPTED COORDINATES OF THE FORTY-EIGHT COMPARISON STARS FOR THE EPOCH 1916.0, FROM PLATES IV, V, VI, VII, VIII

NO.	X	Y	X''	Y''	ΔX	ΔY
	r	r	"	"	"	"
1	−66.6235	− 7.8687	−2525.03	− 298.22	−0.18	+0.17
2	−63.0734	−47.0871	−2390.48	−1784.60	−0.13	−0.24
3	−55.6029	−31.0200	−2107.35	−1175.66	−0.12	−0.19
4	−55.0116	+12.5963	−2084.94	+ 477.40	+0.68	+0.12
5	−53.1145	−12.9364	−2013.04	− 490.29	+0.04	+0.36
6	−47.6681	+35.0329	−1806.62	+1327.75	−0.12	+0.17
7	−45.9140	+52.9384	−1740.14	+2006.37	+0.37	+0.15
8	−46.2174	−46.0612	−1751.74	−1745.92	+0.43	−0.17
9	−46.2520	−56.5187	−1752.95	−2142.06	−0.16	−0.83
10	−42.1659	+25.6022	−1598.09	+ 970.32	+0.68	+0.08
11	−41.5319	+43.7942	−1574.06	+1659.80	+0.34	+0.44
12	−40.9823	+39.9480	−1553.13	+1514.03	+2.82	+1.89
13	−40.7554	+10.5277	−1544.63	+ 399.00	−0.21	−0.13
14	−38.0293	−26.9224	−1441.25	−1020.56	+0.36	+0.07
15	−31.2673	−62.7294	−1185.03	−2377.44	+1.70	−0.52
16	−29.0101	+42.0478	−1099.48	+1593.61	−0.30	+0.03
17	−28.5379	−19.7306	−1081.59	− 747.79	+0.26	−0.60
18	−27.5134	+53.3417	−1042.76	+2021.65	+0.38	+0.65
19	−25.6385	−53.0854	− 971.70	−2011.94	+0.51	−0.52
20	−18.1396	+19.0198	− 687.49	+ 720.85	−0.60	−0.40
21	−14.1298	− 8.0555	− 535.52	− 305.30	+0.22	+0.02
22	− 8.6794	−45.5563	− 328.95	−1726.58	+0.86	−1.35
23	− 8.5438	+ 5.8488	− 323.81	+ 221.67	−0.10	−0.06
24	− 0.9499	+36.1628	− 36.00	+1370.57	−0.27	+0.42
25	− 0.2512	−20.3819	− 9.52	− 772.47	+2.52	−0.74
26	− 0.0013	+ 0.0104	− 0.05	+ 0.39	−0.54	+0.42
27	+ 0.6705	+20.5371	+ 25.41	+ 778.35	+0.49	−0.44
28	+ 1.4852	−56.8586	+ 56.29	−2154.94	+0.02	−0.58
29	+ 2.0629	+50.4124	+ 78.18	+1910.63	−1.79	−0.43
30	+ 7.3889	−45.5818	+ 280.04	−1727.55	+0.36	−0.65
31	+ 8.6251	−72.8082	+ 326.89	−2759.43	−0.42	+0.79
32	+12.9602	−15.1757	+ 491.19	− 575.16	−0.07	+0.51
33	+13.4961	+10.0931	+ 511.50	+ 382.53	+0.08	+0.18
34	+18.4114	− 1.5211	+ 697.79	− 57.65	+0.24	0.00
35	+20.1119	−25.1206	+ 762.24	− 952.07	+1.04	+0.02
36	+20.3570	+19.6612	+ 771.53	+ 745.16	−0.28	+0.67
37	+20.8208	+51.0959	+ 789.11	+1936.53	−0.46	+0.70
38	+27.4589	+38.2554	+1040.69	+1449.88	−0.52	+0.81
39	+28.4871	−69.6786	+1079.66	−2640.82	+0.61	−1.07
40	+30.7013	−24.3327	+1163.58	− 922.21	−0.36	−0.16

TABLE 10

ADOPTED COORDINATES OF THE FORTY-EIGHT COMPARISON STARS FOR THE EPOCH 1916.0 FROM PLATES IV, V, VI, VII, VIII — CONTINUED

NO.	X	Y	X''	Y''	ΔX	ΔY
	r	r	"	"	"	"
41	+31.8684	−45.8061	+1207.81	−1736.05	−0.31	−0.13
42	+37.9939	−46.3196	+1439.97	−1755.51	−0.07	−0.14
43	+39.7111	−10.4364	+1505.05	− 395.54	−0.01	+0.02
44	+40.5747	+13.8926	+1537.78	+ 526.53	−0.45	+0.25
45	+54.1208	+50.3288	+2051.08	+1907.46	−0.60	+1.10
46	+57.5660	−57.2903	+2181.75	−2171.30	+0.22	−1.00
47	+63.4898	−33.6765	+2406.26	−1276.34	+2.21	−1.22
48	+63.3032	+35.3305	+2399.19	+1339.02	−0.71	+0.40

In order to check the adopted coordinates of the catalogued stars, their positions derived from the catalogues were compared with their places found from the plates, and the annual proper motions were determined anew, as follows:

STAR	μ	μ'
	s	"
18	0.00	−0.0085
22	−0.0017	−0.050
25	−0.018	−0.032
29	−0.009	−0.0075
38	0.00	+0.032
41	0.00	−0.0042
42	0.00	0.00
47	+0.0088	−0.057

When these proper motions are applied the positions of the six original catalogued stars, for the epoch 1900.0, become,

STAR	R. A.	DECL.
	h m s	° ′ ″
18	0 35 31.16	+41 10 56.15
22	0 36 34.81	40 8 29.67
38	0 38 35.49	41 1 24.21
41	0 38 48.87	40 8 17.45
42	0 39 9.12	40 7 56.82
47	0 40 33.74	+40 15 48.60

and the corresponding values of the standard coordinates are

STAR	X	Y	ΔX	ΔY
	"	"	"	"
18	−1042.62	+2021.80	+0.14	+0.15
22	− 329.11	−1726.87	−0.16	−0.29
38	+1040.94	+1449.80	+0.25	−0.08
41	+1208.26	−1736.32	+0.45	−0.27
42	+1440.61	−1755.70	+0.64	−0.19
47	+2406.44	−1276.26	+0.18	+0.08

These residuals are the differences between these values of X and Y and those given in Table 10. They include the errors of the catalogued positions, the errors of the computed proper motions, and the errors in the measurement of Plates IV, V, VI, VII, and VIII.

MAGNITUDES

No attempt was made to determine the magnitudes of the stars on the standard scale. Their approximate magnitudes were needed, however, to see whether a magnitude correction to the coordinates would be required, since the stars measured had a range of about twelve magnitudes. It was also thought that the fainter

stars would more probably belong to the nebula than the brighter ones, and on this account it was desirable to sift them out and study their motions separately.

Plate VII and Plates IX to XV inclusive were used in determining the magnitudes. Plate VII, of the nebula, and Plate IX, of the polar region, were taken on the same night under as nearly the same conditions as possible. Enough stars with well determined magnitudes were found on Plate IX to furnish a good scale of magnitudes for the brighter stars. The magnitudes of the forty-eight comparison stars were obtained by superposing these plates.

Plate XI, of the nebula, and Plate XII, of the Harvard Region B, (R.A. 1^h 20^m; Decl. $+45°$, 1900), were taken on the same night under as nearly the same conditions as possible. The stars of Region B were identified and their magnitudes, as given in the *Annals of the Harvard College Observatory*, Vol. 71, No. 4, were marked on the plate. This gave a good scale of magnitudes from 7.3 to 15.6. The first determinations of the magnitudes of the comparison stars were checked by comparison with this plate, and from it the magnitudes of a large number of faint stars were also obtained.

A simple comparator was constructed for comparing the plates. It had two objectives of very nearly the same power, and a duplex eyepiece, and was so arranged that images of strips of the two plates could be seen in the same field of view side by side. The plates were carried on a frame which permitted an up and down movement of one plate and a right and left movement of the other. The frame could also be moved back and forth under the microscope, and the microscope adjusted to right and left. By these movements any two images, one from each plate, could easily be brought into position for comparison. A mirror reflected sky light through the plates to illuminate them.

Plates XI and XII were first compared by superposition, and as many of the stars already measured for position on Plates III and V as appeared on Plate XI were measured for magnitude. The plates were then put into the comparator and the measures for magnitude repeated. The comparator was much more convenient to use, and the magnitudes obtained with it agreed very closely with those determined by superposing the plates. The means of these measures were used in most cases, a slightly greater weight being given to values obtained with the comparator where the differences were appreciable.

The magnitudes of a large number of stars were marked on Plate XI, and a careful study of the stars in small groups was made in order to determine corrections by intercomparisons. These stars were then used as standards for determining the magnitudes of the fainter stars on Plate V. Plate XV had six exposures of the Pleiades, with times of exposure ranging from fifteen seconds to eight minutes. Alcyone and the three stars near it were selected and lettered on this plate, after which it was compared with Plate V. The series of images on Plate XV overlapped and furnished a reliable series of magnitudes. The stars measured on Plate VII were remeasured on Plate V in terms of these letters, and a curve was then drawn using the letters and magnitudes as arguments. This curve was extended four magnitudes farther, and the fainter stars on Plate V were measured in letters and reduced by reading the corresponding magnitudes from the curve.

MEASUREMENT AND REDUCTION OF PLATES III AND V

More than twelve hundred stars were measured on these plates. Since they could not all be measured at a sitting, the plates were divided into sections for measurement and reduction. There were thirteen sections, so selected that they extended across the major axis of the nebula, with some of the sections overlapping, to give a check upon the work. The measures were made in the following order: A number of comparison stars were first measured; next, the stars of the section were measured; and then the same comparison stars were measured again. This constituted a half set of measures. The plate was then reversed and the measures repeated, to give the second half set. Two settings were made on each star to form a measure, and both coordinates were measured at the same time. For each section there were eight readings on each of the comparison stars used, and four readings for each of the other stars. In the first sections

measured from ten to fifteen comparison stars were used, and in the later ones twenty. The average number for all sections was sixteen and one-half.

A chart was made of each section measured, giving approximately the positions and magnitudes of the stars. The stars were numbered on the charts nearly in the order of their right ascensions, and the charts were used to identify the stars during the measurement of Plate V, and also in the determination of their magnitudes from the other plates.

TABLE 11

PLATE CONSTANTS FOR SECTIONS OF PLATES III AND V

PLATE III

SECTION	a	b	c	d	e	f	r_x	r_y
	″	″	″	″	″	″	″	″
I	0.69	37.9406	+0.0224	−0.57	+0.0234	37.9179	0.12	0.17
II	0.51	37.9391	−0.0102	−0.03	0.0473	37.9184	0.08	0.11
III	0.52	37.9298	−0.0020	−0.27	0.0648	37.9144	0.11	0.15
IV	0.51	37.9391	−0.0052	−0.03	0.0473	37.9184	0.11	0.11
V	0.57	37.9270	−0.0237	−0.29	0.0678	37.9142	0.13	0.17
VI	0.49	37.9302	−0.0177	−0.13	0.0705	37.9185	0.12	0.19
VII	0.19	37.9430	+0.0050	+0.38	0.0379	37.9164	0.17	0.13
VIII	0.14	37.9429	+0.0050	+0.28	0.0379	37.9164	0.14	0.15
IX	0.58	37.9264	−0.0061	+0.06	0.0582	37.9163	0.10	0.17
X	0.58	37.9360	−0.0206	−0.07	0.0697	37.9139	0.21	0.16
XI	0.26	37.9430	+0.0100	+0.61	0.0330	37.9210	0.11	0.23
XII	0.41	37.9329	−0.0211	−0.02	+0.0742	37.9136	0.08	0.17
XIII	0.53	37.9357	+0.0300	−0.06	−0.0006	37.9300	0.18	0.22

PLATE V

SECTION	a	b	c	d	e	f	r_x	r_y
	″	″	″	″	″	″	″	″
I	−0.22	37.9352	0.0507	0.58	−0.0033	37.9188	0.20	0.20
II	−0.01	37.9379	0.0075	0.39	+0.0380	37.9208	0.09	0.08
III	−0.06	37.9314	0.0041	0.18	0.0613	37.9114	0.15	0.09
IV	−0.04	37.9338	0.0088	0.33	0.0379	37.9258	0.12	0.10
V	+0.05	37.9304	0.0121	0.38	0.0362	37.9212	0.11	0.09
VI	+0.15	37.9288	0.0127	0.39	0.0447	37.9225	0.12	0.17
VII	+0.09	37.9429	0.0075	0.39	0.0379	37.9208	0.16	0.11
VIII	+0.05	37.9397	0.0075	0.39	0.0379	37.9208	0.15	0.14
IX	−0.09	37.9290	0.0042	0.28	0.0507	37.9079	0.18	0.11
X	−0.06	37.9284	0.0112	0.61	0.0420	37.9219	0.11	0.14
XI	0.00	37.9379	0.0075	0.29	0.0379	37.9210	0.10	0.08
XII	−0.10	37.9297	0.0113	0.44	+0.0406	37.9142	0.12	0.20
XIII	+0.09	37.9319	0.0652	0.38	−0.0213	37.9341	0.14	0.18

The constants are positive, except as indicated. The r_x's and r_y's are ±.

The measures of each section were reduced in the manner already explained for the comparison stars of Plate VIII. The adopted coordinates of the comparison stars used in these reductions are given in Tables 9 and 10, and the plate constants for the several sections are given in Table 11. The plate constants include the corrections for scale value, orientation, refraction, and aberration.

Table 13 gives the measured and reduced coordinates of Messier 31, the great nebula in Andromeda; Messier 32, the small circular nebula on its south following side, first described by Le Gentil in 1749; and H. V. 18, the small elongated nebula on the north preceding side, discovered by Miss Caroline Herschel in 1783. These coordinates are for the epoch 1900.0, and are referred to star 26 as an origin.

Table 14 gives the rectangular coordinates of the stars and nebulous knots measured on Plates III and V. The stars are arranged in sections approximately in the order of their right ascensions, and assigned numbers beginning with 51. Fifty comparison stars were originally selected; of these forty-eight are retained, and numbered from 1 to 48.

In Tables 13 and 14, the *measured coordinates*, x and y, are the uncorrected values, expressed in revolutions of the screw; and the *reduced coordinates*, X and Y, are the values expressed in seconds of arc after applying corrections corresponding to the plate constants given in Table 11. The *reduced coordinates* have been checked by calculating their values from the *measured coordinates* and the plate constants by means of equations (6). The products, bx, cy, ex, and fy, were formed with a Millionaire computing machine.

A few stars belonging to other sections were measured with the stars of Section XIII and reduced with the plate constants of this section. These stars are placed in their proper sections, but they are indicated by having an asterisk placed after each measured coordinate which was measured in this manner. Some of the stars were so measured on one plate only, III or V, and others on both of these plates.

The right ascensions and declinations of the stars for the epoch 1900.0 may be found from these values of X and Y by the use of equations (2) or (4). In Table 14, V_X and V_Y, are the differences of the reduced coordinates from Plates III and V. They include the errors of measurement and reduction, and the proper motions of the stars for the sixteen year interval, from 1899 to 1915.

The differences, V_X and V_Y, for all the stars and nebulous knots, were arranged in order of magnitude, and examined for systematic errors and tested for agreement with the law of probability. The residuals given in Table 14 show a slight shift of the whole system, of about $+0''.06$ in right ascension and $-0''.04$ in declination, for the interval of sixteen years. This motion is toward the sun's antapex, and might be accounted for by the parallactic motion of the fainter stars due to the motion of the sun, the motion of the brighter stars having been eliminated in the preparation of the standard coordinates, given in Tables 9 and 10. Assuming the distance of stars of the fifteenth magnitude to be 2300 light years, as estimated by Professor Newcomb, and the motion of the sun to be twenty kilometers per second, this motion is too great to be accounted for in this manner unless it is influenced by stars of fainter magnitude.

When the residuals are arranged according to the magnitudes of the stars, a very noticeable progression is found toward the negative for the fainter stars in both right ascension and declination. This progression of residuals with magnitude is probably due to a combination of guiding error on the long exposures, to parallactic motion of the sun, and to errors of measurement. The direction in declination is consistent with the results of Boss, Dyson, Thackeray, Comstock, Stumpe, and Newcomb, all of whom in computing the position of the solar apex found a considerable increase in the declination of the apex with increasing faintness of the stars. The reverse change would be expected in the stars. Evidence of a similar but smaller change in the right ascension of the apex with increase in faintness of stars is indicated by this work.

The residuals were plotted, using magnitudes as ordinates. They gave a smooth line, slightly curved, from which a table of corrections was computed for stars fainter than the twelfth magnitude. After corrections had been applied to the stars from the twelfth to the nineteenth magnitude, the residuals were examined for comparison

of the actual and theoretical distribution of errors. The *huge error* was found to be 1″.80. Omitting stars with residuals exceeding this, the probable error was found to be 0″.34, and the actual and theoretical distribution of errors were found to be as given in Table 12.

Sections of the plates were selected and the residuals counted. These sections were compared in pairs, two at opposite ends of the spiral, two on opposite sides of the nucleus, and two along the densest parts of the spiral stream. Slight motions were detected in the sections, but they were not consistent with any motion of rotation. The same test was made, with the same result, using the residuals after the systematic motion had been eliminated by the method indicated above, and also by a change of origin of coordinates to compensate for the shift of the whole system during the interval of sixteen years.

Through the kindness of Professor Frost, I had the use of the stereocomparator at the Yerkes Observatory for making a very careful comparison of Plates III and V. The difference in the character of the plates, due to the difference in intensity of the images, made small motions difficult to detect. Slight differences in the forms of some of the nebulous knots were noted, but they were very small and too indefinite to be measured, and might easily have been due to the differences of the plates. No real motions of the nebulous knots were detected with certainty.

With the stereocomparator, one star near the edge of the plates, remote from the nebula, and entirely outside the region measured, was shown to have an appreciable proper motion.

The star, No. 543, was measured on Plate V, with an estimated magnitude of 15.5. Its appearance on this plate is in all respects similar to that of the two stars which are nearest it. It does not appear on Plate III, nor on any of the other plates, and it may be a temporary star, several of which have been reported in this nebula in recent years.

In conclusion I wish to express my thanks to those who have aided me in this study. They are hereby gratefully expressed in particular to Professor H. C. Wilson, Director of the Goodsell Observatory, under whose direction the work was begun. He suggested the problem, planned the work, and furnished a number of the plates. Throughout the work he has been a constant source of help and encouragement. My thanks are also due to the trustees of Carleton College for the use, of the instruments of the Goodsell

TABLE 12

COMPARISON OF ACTUAL AND THEORETICAL ERRORS

MAGNITUDE OF ERROR	RIGHT ASCENSION		DECLINATION	
	ACTUAL NUMBER OF ERRORS	THEORETICAL NUMBER OF ERRORS	ACTUAL NUMBER OF ERRORS	THEORETICAL NUMBER OF ERRORS
″				
0.0	193	160	146	154
0.1	331	296	346	283
0.3	206	232	225	230
0.5	132	155	137	158
0.7	60	98	64	94
0.9	34	43	41	48
1.1	22	18	25	22
1.3	12	6	14	8
1.5	9	2	8	3
1.7	0	1	0	1

Observatory; to Professor Frost for the use of the stereocomparator of the Yerkes Observatory; and to Professors W. J. Hussey, R. H. Curtiss, and W. C. Rufus, of the University of Michigan, where the work was completed and prepared for publication.

TABLE 13

MEASURED AND REDUCED COORDINATES FOR 1900.0 OF MESSIER 31, MESSIER 32, AND H. V. 18

MESSIER 31, THE ANDROMEDA NEBULA

PLATE	MEASURED COORDINATES		REDUCED COORDINATES	
	x	y	X	Y
	r	r	″	″
I	+ 4.0288	+ 9.4730	+ 152.37	+ 359.71
II	4.0008	9.4250	151.52	358.15
IV	4.0190	9.4528	151.38	359.73
VI	3.9642	9.4748	150.57	359.57
VII	3.9761	9.4696	150.75	359.39
VIII	+ 3.9920	+ 9.4496	+ 151.47	+ 358.51
Mean			+ 151.34	+ 359.18

MESSIER 32

PLATE	MEASURED COORDINATES		REDUCED COORDINATES	
	x	y	X	Y
	r	r	″	″
I	+ 3.3415	−28.8770	+ 127.34	−1094.08
II	3.3292	28.8735	127.55	1093.96
IV	3.2628	28.8742	126.37	1093.74
VI	3.3420	28.8872	125.86	1094.87
VII	3.3339	28.8758	127.20	1094.52
VIII	+ 3.3427	−28.8774	+ 127.17	−1094.76
Mean			+ 126.91	−1094.32

TABLE 13

MEASURED AND REDUCED COORDINATES FOR 1900.0 — CONTINUED

H. V. 18

PLATE	MEASURED COORDINATES		REDUCED COORDINATES	
	x	y	X	Y
	r	r	$''$	$''$
I	−38.0672	+49.1078	−1445.82	+1859.29
II	38.0948	49.1008	1446.70	1859.04
IV	37.9820	49.1313	1445.42	1858.52
VI	−38.1580	+49.0880	−1446.94	+1859.83
Mean			−1446.22	+1859.17

TABLE 14

SECTION Ia. MEASURED COORDINATES

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
51	13.3	+33.2074	+29.3750	+33.2052	+29.3755
52	10.8	33.3762	21.8560	33.3696	21.8670
53	11.9	33.7044	33.4395	33.7163	33.4458
54	16.8	34.2736	32.9632	34.2826	32.9538
55	15.7	34.3469	29.6760	34.3488	29.6742
56	16.4	+34.4084	+23.0530	+34.4176	+23.0370
57	15.9	34.6162	24.4415	34.6250	24.4122
58	17.3	34.7032	23.4148	34.6838	23.4038
59	16.2	35.0676	32.8492	35.0938	32.8172
60	16.8	35.4119	24.5127	35.4333	24.5312
61	12.7	+35.6179	+29.8672	+35.6215	+29.8715
62	16.3	35.6499	30.4272	35.6410	30.4102
63	16.2	35.7052	23.9738	35.6923	23.9582
64	15.7	35.8732	31.7160	35.8670	31.7122
65	17.9	35.9019	31.2195	35.8908	31.2095
66	16.2	+36.4889	+23.2932	+36.5015	+23.2862
67	16.2	36.6394	23.7262	36.6326	23.7332
68	16.4	36.6556	31.7710	36.6438	31.7602
69	17.3	36.7374	25.2552	36.7320	25.2410
70	11.3	36.8409	32.5075	36.8376	32.5082
71	17.3	+37.3304	+26.0352	+37.3436	+26.0712
72	15.7	37.5189	24.0165	37.5308	24.0088
73	16.8	37.7659	23.9568	37.7918	23.9370
74	15.9	37.8714	26.6035	37.8878	26.6098
75	17.9	37.9359	32.9710	37.9115	32.9480
76	17.5	+38.0076	+24.6932	+37.9858	+24.6910
77	15.7	38.0526	29.8040	38.0620	29.7905
78	13.9	38.1309	25.6630	38.1540	25.6742
79	12.8	38.3916	27.8368	38.3996	27.8380
80	17.5	38.7854	22.5258	38.7978	22.5000
81	15.2	+38.7896	+26.0348	+38.8043	+26.0595
82	16.7	39.2924	30.0515	39.2988	30.0315
83	13.2	39.3019	26.9080	39.3213	26.9060
84	15.2	39.3164	26.2222	39.3123	26.2232
85	15.7	39.3406	33.8512	39.3313	33.8442
86	16.2	+40.6334	+31.2558	+40.6326	+31.2568
87	16.8	40.9672	33.2535	40.9626	33.2282
88	16.8	40.9879	24.7798	40.9823	24.7752
89	17.9	41.0142	24.0500	41.0776	24.0488
90	14.2	41.2676	32.5835	41.2820	32.5725

TABLE 14
SECTION Ia. REDUCED COORDINATES

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
51	+1261.26	+1114.05	+1260.92	+1114.35	−0.34	+0.30
52	1267.49	828.94	1266.77	829.64	−0.72	+0.70
53	1280.20	1268.17	1280.51	1268.69	+0.31	+0.52
54	1301.79	1250.13	1301.97	1250.04	+0.18	−0.09
55	1304.50	1125.49	1304.31	1125.68	−0.19	+0.19
56	+1306.68	+ 874.36	+1306.59	+ 874.00	−0.09	−0.36
57	1314.60	927.01	1314.52	926.15	−0.08	−0.86
58	1317.87	888.08	1316.70	887.91	−1.17	−0.17
59	1331.91	1245.82	1332.73	1244.85	+0.82	−0.97
60	1344.79	929.73	1345.19	930.66	+0.40	+0.93
61	+1352.72	+1132.76	+1352.60	+1133.15	−0.12	+0.39
62	1353.95	1154.00	1353.37	1153.58	−0.58	−0.42
63	1355.90	909.30	1354.99	908.93	−0.91	−0.37
64	1362.45	1202.87	1362.01	1202.95	−0.44	+0.08
65	1363.53	1184.05	1362.89	1183.89	−0.64	−0.16
66	+1385.62	+ 883.51	+1385.65	+ 883.44	+0.03	−0.07
67	1391.34	899.94	1390.65	900.39	−0.69	+0.45
68	1392.14	1204.98	1391.48	1204.77	−0.66	−0.21
69	1395.09	957.91	1394.50	957.57	−0.59	−0.34
70	1399.18	1232.91	1398.87	1233.13	−0.31	+0.22
71	+1417.61	+ 987.50	+1417.74	+ 989.05	+0.13	+1.55
72	1424.72	910.96	1424.74	910.84	+0.02	−0.12
73	1434.09	908.71	1434.63	908.12	+0.54	−0.59
74	1438.15	1009.07	1438.41	1009.47	+0.26	+0.40
75	1440.74	1250.51	1439.63	1249.80	−1.11	−0.71
76	+1443.27	+ 936.63	+1442.03	+ 936.71	−1.24	+0.08
77	1445.10	1130.43	1445.18	1130.07	+0.08	−0.36
78	1447.97	973.41	1448.46	973.99	+0.49	+0.58
79	1457.91	1055.84	1457.89	1056.04	−0.02	+0.20
80	1472.74	854.47	1472.72	853.63	−0.02	−0.84
81	+1472.97	+ 987.52	+1473.15	+ 988.60	+0.18	+1.08
82	1492.14	1139.84	1492.11	1139.21	−0.03	−0.63
83	1492.43	1020.64	1492.81	1020.69	+0.38	+0.05
84	1492.97	994.64	1492.43	994.80	−0.54	+0.16
85	1494.05	1283.92	1493.54	1283.78	−0.51	−0.14
86	+1543.05	+1185.54	+1542.77	+1185.67	−0.28	+0.13
87	1555.76	1261.29	1555.39	1260.42	−0.37	−0.87
88	1556.35	939.99	1555.71	939.89	−0.64	−0.10
89	1557.33	912.32	1559.29	912.35	+1.96	+0.03
90	1567.14	1235.89	1567.47	1235.55	+0.33	−0.34

TABLE 14

SECTION Ia. MEASURED COORDINATES — CONTINUED

NO.	MAG	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
91	15.4	+41.3974	+29.8540	+41.3958	+29.8485
92	15.2	41.7132	32.7192	41.7198	32.7202
93	11.3	41.8672	23.9398	41.8990	23.9460
94	15.5	42.4452	33.4368	42.4386	33.4340
95	15.2	43.1624	25.9785	43.1753	25.9578
96	16.8	+43.5626	+25.2810	+43.5590	+25.2705
97	17.9	43.7366	24.8878	43.7310	24.8740
98	16.8	45.9596	31.0815	45.9538	31.0822
99	15.2	46.0372	22.6958	46.0503	22.6870
100	14.4	46.0639	28.7375	46.0860	28.7370
101	14.7	+46.2169	+29.1235	+46.2388	+29.1345
102	15.7	46.6212	28.3822	46.6210	28.3752
103	13.3	46.6522	32.9920	46.6676	33.0035
104	13.7	46.8486	25.4597	46.8620	25.4752
105	14.2	46.9569	27.6408	46.9695	27.6542
106	15.2	+47.0122	+24.0285	+47.0068	+24.0265

SECTION Ib. MEASURED COORDINATES

107		+13.7136	+ 6.2032		
108	11.9	14.6936	− 4.3040	+14.7120	− 4.3090
109	17.6	14.7449	+ 3.8158	14.7506	+ 3.8272
110	17.9	14.9046	+ 6.3450		
111	16.8	15.1326	+ 3.4845	+15.1745	+ 3.4510
112	14.2	+15.5534	− 0.3412	+15.5798	− 0.3505
113	16.8	16.1909	+ 3.0708	16.2013	+ 3.0510
114	16.2	16.2706	+ 7.3078	16.2993	+ 7.2660
115	15.5	16.4744	+ 6.5712	16.5020	+ 6.5582
116	14.0	17.0014	+ 6.6755	17.0448	+ 6.6705
117	15.2	+17.1134	+ 7.1190	+17.1426	+ 7.1022
118	12.6	17.1262	+ 2.5542	17.1533	+ 2.5405
119	16.8	17.1289	+ 4.1852	17.1853	+ 4.1780
120	16.2	17.3559	+ 0.8375	17.3921	+ 0.7870
121	15.5	17.4556	+ 3.3500	17.4726	+ 3.2952
122	17.6	+17.5724	+ 7.1042	+17.5948	+ 7.0860
123	15.5	18.4922	+ 3.2340	18.5160	+ 3.2110
34	10.5	18.3762	− 1.5190	+18.4065	− 1.5445
124	15.2	18.8674	+ 5.3852	18.8848	+ 5.3715
125	16.0	19.7189	+ 7.2802	19.7326	+ 7.2645

TABLE 14

SECTION Ia. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
91	+1572.00	+1132.40	+1571.65	+1132.26	−0.35	−0.14
92	1584.05	1241.05	1584.09	1241.15	+0.04	+0.10
93	1589.69	908.16	1590.44	908.45	+0.75	+0.29
94	1611.84	1268.28	1611.39	1268.22	−0.45	−0.06
95	1638.88	985.49	1638.96	984.73	+0.08	−0.76
96	+1654.05	+ 959.05	+1653.48	+ 958.66	−0.57	−0.39
97	1660.64	944.15	1659.99	943.63	−0.65	−0.52
98	1745.12	1179.05	1744.62	1179.03	−0.50	−0.02
99	1747.88	861.08	1747.86	860.69	−0.02	−0.39
100	1749.03	1090.17	1749.52	1090.10	+0.49	−0.07
101	+1754.84	+1104.81	+1755.34	+1105.17	+0.50	+0.36
102	1770.16	1076.71	1769.80	1076.38	−0.36	−0.33
103	1771.44	1251.51	1771.80	1251.88	+0.36	+0.37
104	1778.72	965.90	1778.79	966.41	+0.07	+0.51
105	1782.88	1048.61	1782.98	1049.04	+0.10	+0.43
106	+1784.90	+ 911.64	+1784.21	+ 911.48	−0.69	−0.16

SECTION Ib. REDUCED COORDINATES

107	+ 521.13	+ 234.96				
108	558.08	− 163.42	+ 557.66	− 162.86	−0.42	+0.56
109	560.21	+ 144.46	559.54	+ 145.65	−0.67	+1.19
110	566.32	+ 240.37				
111	574.91	+ 131.91	575.60	+ 131.39	+0.69	−0.52
112	+ 590.79	− 13.14	+ 590.78	− 12.76	−0.01	+0.38
113	615.05	+ 116.25	614.53	+ 116.22	−0.52	−0.03
114	618.17	+ 276.91	618.47	+ 276.04	+0.30	−0.87
115	625.89	+ 248.98	626.12	+ 249.20	+0.23	+0.22
116	645.88	+ 252.95	646.72	+ 253.46	+0.84	+0.51
117	+ 650.14	+ 269.77	+ 650.45	+ 269.83	+0.31	+0.06
118	650.53	+ 96.68	650.62	+ 96.86	+0.09	+0.18
119	650.66	+ 158.52	651.92	+ 158.95	+1.26	+0.43
120	659.20	+ 31.59	659.59	+ 30.36	+0.39	−1.23
121	663.04	+ 126.86	662.77	+ 125.47	−0.27	−1.39
122	+ 667.56	+ 269.22	+ 667.60	+ 269.21	+0.04	−0.01
34	697.86	− 57.74	697.96	− 58.05	+0.10	−0.31
123	702.37	+ 122.49	702.35	+ 122.28	−0.02	−0.21
124	716.65	+ 204.10	716.45	+ 204.20	−0.20	+0.13
125	749.00	+ 275.94	748.71	+ 275.98	−0.29	+0.04

TABLE 14

SECTION Ib. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
126	14.7	+20.2954	+ 1.9345	20.3215	+ 1.9022
127	14.0	20.3492	+ 2.2468	+20.3828	+ 2.2400
128	15.5	20.3854	+ 0.0370	20.4098	+ 0.0182
129	14.7	20.7719	+ 6.4610	20.7970	+ 6.4412

SECTION II. MEASURED COORDINATES

130	16.4	+30.5252	+63.7346	+30.5117	+63.7340
131	14.2	30.8160	59.0974	30.8110	59.1032
132	17.1	31.0308	62.9881	31.0052	62.9920
133	15.5	31.3852	65.4194	31.3754	65.4135
134	17.9	31.4045	62.5764		
135	15.5	+31.5675	+58.5966	+31.5460	+58.6112
136	15.7	31.9582	60.3821	31.9484	60.3855
137	16.8	32.1925	63.0148	32.1907	63.0330
138	16.2	32.4798	50.0158	32.4892	50.0208
139	11.8	32.6390	69.4332	32.6437	69.4368
140	16.8	+32.8355	+52.2986	+32.8217	+52.3105
141	15.7	32.8525	56.3768	32.8367	56.3510
142	16.2	32.9078	66.9791	32.9092	66.9660
143	15.2	32.9638	69.5386	32.9777	69.5362
144	16.6	32.9728	62.0578	32.9777	62.0192
145	17.0	+33.2115	+49.5366	+33.2174	+49.5162
146	16.8	33.2598	61.4411	33.2344	61.4325
147	16.8	33.3078	66.8356		
148	15.4	33.3505	65.4321	33.3604	65.4405
149	15.0	33.5162	63.2776	33.5135	63.2682
150	13.5	+34.7480	+69.0066	+34.7507	+69.0115
151	14.7	34.9492	53.7271	34.9642	53.7168
152	15.7	35.0275	56.2656	35.0170	56.2532
153	14.3	35.1458	52.8231	35.1467	52.8228
154	15.7	35.2118	66.7321	35.1830	66.7245
155	13.3	+35.2585	+52.0231	+35.2620	+52.0302
156	13.7	35.3035	69.5353	35.3067	69.5370
157	15.7	35.5195	67.5974	35.5304	67.6022
158	14.9	35.6445	60.7984	35.6435	60.7975
159	16.6	36.4078	71.4331	36.4040	71.4308

TABLE 14

SECTION Ib. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
126	+ 770.75	+ 73.26	+ 770.78	+ 72.64	+0.03	−0.62
127	772.80	+ 85.10	773.12	+ 85.45	+0.32	+0.35
128	774.13	+ 1.31	774.03	+ 1.20	−0.10	−0.11
129	788.93	+ 244.90	789.04	+ 244.75	+0.11	−0.15

SECTION II. REDUCED COORDINATES

130	+1157.96	+2418.13	+1158.02	+2418.39	+0.06	+0.26
131	1169.04	2242.31	1169.34	2242.80	+0.30	+0.49
132	1177.15	2389.85	1176.73	2390.28	−0.42	+0.43
133	1190.57	2482.05	1190.80	2482.11	+0.23	+0.06
134	1191.33	2374.25				
135	+1197.55	+2223.35	+1197.22	+2224.17	−0.33	+0.82
136	1212.36	2291.07	1212.50	2291.47	+0.14	+0.40
137	1221.22	2390.91	1221.71	2391.87	+0.49	+0.96
138	1232.25	1898.03	1232.94	1898.45	+0.69	+0.42
139	1238.10	2634.31	1238.94	2634.73	+0.84	+0.42
140	+1245.73	+1984.60	+1245.57	+1985.29	−0.16	+0.69
141	1246.33	2139.24	1246.17	2138.51	−0.16	−0.73
142	1248.32	2541.27	1249.00	2541.04	+0.68	−0.23
143	1250.42	2638.32	1251.62	2638.51	+1.20	+0.19
144	1250.84	2354.66	1251.56	2353.46	+0.72	−1.20
145	+1260.02	+1879.89	+1260.56	+1879.35	+0.54	−0.54
146	1261.73	2331.29	1261.29	2331.22	−0.44	−0.07
147	1263.50	2535.84				
148	1265.13	2482.63	1266.10	2483.21	+0.97	+0.58
149	1271.44	2400.94	1271.90	2400.84	+0.46	−0.10
150	+1318.11	+2618.23	+1318.88	+2618.68	+0.77	+0.45
151	1325.90	2038.87	1326.86	2038.70	+0.96	−0.17
152	1328.85	2135.13	1328.88	2134.89	+0.03	−0.24
153	1333.37	2004.60	1333.78	2004.81	+0.41	+0.21
154	1335.73	2532.01	1335.26	2531.97	−0.47	−0.04
155	+1337.66	+1974.27	+1338.15	+1974.76	+0.49	+0.49
156	1339.18	2638.31	1339.97	2638.63	+0.79	+0.32
157	1347.40	2564.84	1348.45	2565.27	+1.05	+0.43
158	1352.21	2307.03	1352.69	2307.23	+0.48	+0.20
159	1381.06	2710.32	1381.62	2710.49	+0.56	+0.17

TABLE 14

SECTION II. MEASURED COÖRDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
160	15.7	+36.5118	+54.2116	+36.5097	+54.2255
161	15.2	36.6648	61.9864	36.6672	61.9902
162	16.2	36.8792	65.6124	36.8677	65.5972
163	13.5	36.9018	66.6096	36.8902	66.6190
164	15.5	36.9258	69.8904	36.9020	69.8792
165	15.9	+36.9652	+57.1258	+36.9552	+57.1195
166	16.2	37.0460	53.0164	37.0454	52.9915
167	16.8	37.0515	49.7006	37.0460	49.7135
168	16.8	37.2048	66.9691	37.2110	66.9898
169	16.5	37.3090	65.0441	37.2947	65.0420
170	15.2	+37.5472	+62.9636	+37.5530	+63.0108
171	14.2	37.6320	60.7341	37.6192	60.7170
172	16.0	37.7285	50.4626	37.7197	50.4642
173	17.3	38.0955	69.2276	38.0892	69.2382
174	16.8	38.5280	69.0961	38.5262	69.0920
175	15.7	+38.6448	+53.5274	+38.6289	+53.5140
176	15.7	38.9280	58.2541	38.8642	58.2360
177	14.2	39.1252	55.0723	38.1230	55.0795
178	16.5	39.2492	60.2458	39.2417	60.2532
179	14.2	39.4175	71.7723	39.4175	71.7710
180	17.0	+40.1025	+66.2711	+40.0837	+66.2930
181	16.8	40.3196	51.3708	40.2762	51.3570
182	16.8	40.4745	58.5744	40.4697	58.5750
183	11.9	40.6075	61.9881	40.6044	61.9902
184	15.5	41.0858	55.5821	41.0854	55.5935
185	15.4	+41.1810	+72.0896	+41.1632	+72.0885
186	13.7	41.3478	57.4096	41.3564	57.4108
187	15.2	42.0055	63.0746	42.0029	63.0640
188	12.8	42.1275	61.4218	42.1300	61.4252
189	14.0	42.1492	53.0231	42.1402	53.0363
190	15.9	+42.6752	+64.1466	+42.6700	+64.1525
191	17.1	43.0442	69.9536	43.0324	69.9500
192	16.8	43.2260	70.0496	43.1957	70.0472
193	14.7	43.3172	51.3654	43.3247	51.3625
194	15.7	43.3845	62.9786	43.3617	62.9628
195	11.9	+43.8458	+62.4461	+43.8402	+62.4462
196	13.3	43.9798	59.8894	43.9620	59.8968
197	17.3	44.2875	64.4046	44.2887	64.4065
198	16.8	44.3265	62.2156	44.3250	62.1858
199	15.2	44.7132	70.8548	44.6872	70.8280

TABLE 14

SECTION II. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
160	+1385.18	+2057.31	+1385.50	+2058.05	+0.32	+0.74
161	1390.91	2352.13	1391.53	2352.50	+0.62	+0.37
162	1399.00	2489.63	1399.17	2489.29	+0.17	−0.34
163	1399.85	2527.44	1400.03	2528.04	+0.18	+0.60
164	1400.73	2651.85	1400.50	2651.67	−0.23	−0.18
165	+1402.35	+2167.84	+1402.42	+2167.81	+0.07	−0.03
166	1405.46	2012.02	1405.81	2011.28	+0.35	−0.74
167	1405.70	1886.29	1405.81	1886.97	+0.11	+0.68
168	1411.34	2541.09	1412.20	2542.11	+0.86	+1.02
169	1415.32	2468.10	1415.36	2468.25	+0.04	+0.15
170	+1424.37	+2389.22	+1425.14	+2391.24	+0.77	+2.02
171	1427.61	2304.69	1427.64	2304.26	+0.03	−0.43
172	1431.38	1915.22	1431.37	1915.47	−0.01	+0.25
173	1445.11	2626.77	1445.53	2627.41	+0.42	+0.64
174	1461.52	2621.81	1462.11	2621.88	+0.59	+0.07
175	+1466.11	+2031.47	+1465.89	+2031.15	−0.22	−0.32
176	1476.81	2210.71	1474.85	2210.22	−1.96	−0.49
177	1484.32	2090.07	1484.65	2090.54	+0.33	+0.47
178	1488.97	2286.25	1489.19	2286.73	+0.22	+0.48
179	1495.24	2723.33	1495.95	2723.50	+0.71	+0.17
180	+1521.29	+2514.76	+1521.18	+2515.80	−0.11	+1.04
181	1529.68	1949.78	1528.37	1949.42	−1.31	−0.36
182	1535.48	2222.93	1535.76	2223.14	+0.28	+0.21
183	1540.49	2352.38	1540.90	2352.65	+0.41	+0.27
184	1558.70	2109.50	1559.10	2110.10	+0.40	+0.60
185	+1562.14	+2735.44	+1562.18	+2735.61	+0.04	+0.17
186	1568.62	2178.81	1569.40	2179.02	+0.78	+0.21
187	1593.52	2393.64	1593.96	2393.42	+0.44	−0.22
188	1598.16	2330.98	1598.77	2331.28	+0.61	+0.30
189	1599.07	2012.51	1599.10	2013.17	+0.03	+0.66
190	+1618.91	+2434.32	+1619.28	+2434.73	+0.37	+0.41
191	1632.85	2654.53	1633.07	2654.59	+0.22	+0.06
192	1639.75	2658.18	1639.27	2658.28	−0.48	+0.10
193	1643.40	1949.71	1644.02	1949.74	+0.62	+0.03
194	1645.84	2390.07	1645.51	2389.64	−0.33	−0.43
195	+1663.34	+2369.90	+1663.66	2370.07	+0.32	+0.17
196	1668.45	2272.96	1668.27	2273.40	−0.18	+0.44
197	1680.08	2444.18	1680.69	2444.42	+0.61	+0.24
198	1681.58	2361.18	1682.05	2360.21	+0.47	−0.97
199	1696.17	2688.79	1695.86	2687.94	−0.31	−0.85

TABLE 14

SECTION II. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
200	12.3	+44.7398	+54.7071	+44.7264	+54.7168
201	16.8	45.0268	69.4276	44.9887	69.4228
202	14.7	45.3885	63.3658	45.3778	63.3688
203	14.9	45.4397	53.0541	45.4282	53.0535
204	17.3	45.5030	58.4364	45.4516	58.4428
205	15.7	+45.5218	+50.9541	+45.5204	+50.9535
206	15.5	45.8558	56.2754	45.8491	56.3008
207	11.2	45.8892	69.4806	45.8912	69.4802
208	16.0	46.2395	62.4493	46.2076	62.4460
209	14.2	46.2512	61.0336	46.2368	61.0355
210	14.3	+46.4220	+67.8138	+46.4104	+67.8258
211	16.8	46.6230	57.4584	46.6284	57.4385
212	15.2	46.9312	70.4561	46.9004	70.4378
213	14.0	47.2205	55.4082	47.2164	55.4265
214	16.8	47.8168	63.9316	47.8017	63.9310
215	17.9			+47.8688	+56.3698
216	15.7	+48.1510	+69.5074	48.1324	69.4910
217	13.1	48.3102	53.0143	48.2961	53.0312
218	16.8	48.3382	67.4986	48.3256	67.5000
219	15.2	48.3868	69.4864	48.3707	69.4725
220	16.0	+48.4475	+58.7041	+48.4024	+58.7008
221	15.7	48.7802	54.3398	48.7764	54.3470
222	16.8	48.8003	67.9424	48.7541	67.9408
223	16.8	49.1372	63.3334	49.1042	63.3230
224	16.2	49.3408	55.8961	49.3371	55.8758
225	14.7	+49.6695	+50.0304	+49.6431	+50.0262
226	14.7	49.8248	62.3306	49.8121	62.3270
227	13.4	49.9462	65.1796	49.9362	65.1735
228	15.7	50.1578	56.7546	50.1424	56.7448
229	15.2	50.3138	67.6816	50.2847	67.6795
230	15.5	+50.4182	+69.0163	+50.4134	+69.0162
231	16.2	50.7319	67.9304	50.7124	67.9145
232	16.8	51.0215	65.9141		
233	17.9	51.1488	61.8851	51.0760	61.8918
234	14.5	51.5616	61.1291	51.5467	61.1250
235	16.6	+51.6785	+63.4508	+51.6512	+63.4410
236	14.4	51.6795	62.6381	51.6635	62.6472
237	16.6	52.1905	63.1006	52.1837	63.1098
238	14.7	52.2322	60.5828	52.2147	60.5848
239	14.4	52.7214	71.5551	52.7057	71.5610

TABLE 14

SECTION II. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
200	+1697.34	+2076.49	+1697.23	+2076.99	−0.11	+0.50
201	1708.08	2634.68	1707.29	2634.67	−0.79	−0.01
202	1721.86	2404.85	1722.00	2405.11	+0.14	+0.26
203	1723.91	2013.85	1723.84	2013.95	−0.07	+0.10
204	1726.26	2217.94	1724.77	2218.31	−1.49	+0.37
205	+1727.05	+1934.22	+1727.32	+1934.32	+0.27	+0.10
206	1739.66	2136.01	1739.83	2137.10	+0.17	+1.09
207	1740.80	2636.73	1741.53	2636.88	+0.73	+0.15
208	1754.16	2370.13	1753.48	2370.15	−0.68	+0.02
209	1754.62	2316.45	1754.57	2316.66	−0.05	+0.21
210	+1761.03	+2573.56	+1761.21	+2574.16	+0.18	+0.60
211	1768.76	2180.91	1769.40	2180.28	+0.64	−0.63
212	1780.32	2673.77	1779.82	2673.23	−0.50	−0.54
213	1791.45	2103.19	1791.70	2104.00	+0.25	+0.81
214	1813.98	2426.42	1813.97	2426.52	−0.01	+0.10
215			+1816.45	+2139.80		
216	+1826.61	+2637.86	1826.55	2637.37	−0.06	−0.49
217	1832.81	2012.47	1832.64	2013.21	−0.17	+0.74
218	1833.73	2561.70	1833.87	2561.88	+0.14	+0.18
219	1835.55	2637.07	1835.59	2636.68	+0.04	−0.39
220	+1837.97	+2228.23	+1836.72	+2228.21	−1.25	−0.02
221	1850.63	2062.76	1850.87	2063.13	+0.24	+0.37
222	1851.26	2578.55	1850.13	2578.61	−1.13	+0.06
223	1864.09	2403.80	1863.38	2403.51	−0.71	−0.29
224	1871.89	2121.79	1872.16	2121.12	+0.27	−0.67
225	+1884.42	+1899.39	+1883.72	+1899.31	−0.70	−0.08
226	1890.18	2365.80	1890.22	2365.77	+0.04	−0.03
227	1894.76	2473.84	1894.95	2473.72	+0.19	−0.12
228	1902.87	2154.39	1902.71	2154.10	−0.16	−0.29
229	1908.68	2568.73	1908.19	2568.76	−0.49	+0.03
230	+1912.63	+2619.34	+1913.09	+2619.46	+0.46	+0.12
231	1924.54	2578.18	1924.42	2577.69	−0.12	−0.49
232	1935.55	2501.74				
233	1940.42	2348.97	1938.17	2349.32	−2.25	+0.35
234	1956.09	2320.33	1956.02	2320.26	−0.07	−0.07
235	+1960.50	+2408.37	+1960.00	+2408.09	−0.50	−0.28
236	1960.54	2377.55	1960.46	2377.99	−0.08	+0.44
237	1979.93	2395.11	1980.20	2395.55	+0.27	+0.44
238	1981.53	2299.64	1981.36	2299.80	−0.17	+0.16
239	1999.98	2715.72	2000.07	2716.04	+0.09	+0.32

TABLE 14

SECTION II. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
240	16.8	+53.0408	+57.9264	+53.0204	+57.8996
241	14.7	53.3198	70.7886	53.2872	70.7775
242	16.8	53.5980	58.6106	53.5884	58.5925
243	17.9	53.6065	57.7568	53.5917	57.7780
244	16.8	53.9108	56.3126	53.9047	56.3232
245	17.9	+53.9708	+56.7526	+53.9477	+56.7262
45	9.7	54.0640	50.2191	54.0472	50.2400
246	17.9			54.2170	58.2678
247	17.9	54.4945	58.1621	54.4652	58.1878
248	17.7	54.9448	58.1866	54.9342	58.1895

SECTION III. MEASURED COORDINATES

249	15.6	+30.3942	+43.3944	+30.3998	+43.3951
250	18.4	30.4002	44.1792	30.4258	44.1958
251	13.3	31.3268	39.0839	31.3258	39.0834
252	18.2	31.8432	43.8104	31.8648	43.7561
253	19.0	32.0162	39.0562	32.0418	39.0461
254	15.7	+32.2277	+42.7184	+32.2158	+42.7254
255	16.8	32.5098	45.4699	32.5144	45.4778
256	16.5	32.8300	46.7304	32.8351	46.7273
257	17.9	32.8672	45.4784	32.8811	45.4531
258	14.7	32.8982	40.4652	32.9141	40.4598
259	17.9	+33.1325	+36.4064	+	+
260	17.9	33.7540	39.2094	33.7566	39.1606
261	14.7	33.7868	41.8706	33.8016	41.8738
262	17.9	34.0445	40.3302	34.0496	40.3096
263	17.9	34.2945	38.8219	34.2864	38.8026
264	15.7	+34.3237	+39.6829	+34.3464	+39.6876
265	16.8	34.3805	37.1104	34.4086	37.1098
266	15.7	34.5262	37.9874	34.5288	37.9994
267	13.3	34.6315	38.1654	34.6538	38.1728
268	17.1	35.6580	41.3244	35.6576	41.3521
269	14.7	+35.6752	+40.9629	+35.6778	+40.9648
270	14.7	35.7848	41.7209	35.8026	41.7141
271	14.7	35.8545	39.4326	35.8698	39.4401
272	17.9	35.9852	44.9179	36.0131	44.8716
273	16.8	36.2485	44.9019	36.2701	44.9214

TABLE 14

SECTION II. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
240	+2012.24	+2198.96	+2011.91	+2198.00	−0.33	−0.96
241	2022.70	2686.68	2022.13	2686.35	−0.57	−0.33
242	2033.37	2224.93	2033.46	2224.30	+0.09	−0.63
243	2033.70	2192.55	2033.58	2193.41	−0.12	+0.86
244	2045.26	2137.80	2045.44	2138.26	+0.18	+0.46
245	+2047.53	+2154.49	+2047.08	+2153.54	−0.45	−0.95
45	2051.14	1906.76	2050.80	1907.58	−0.34	+0.82
246			2057.31	2212.01		
247	2067.39	2207.96	2066.72	2208.99	−0.67	+1.03
248	2084.47	2208.91	2084.51	2209.07	+0.04	+0.16

SECTION III. REDUCED COORDINATES

249	+1153.28	+1646.97	+1153.22	+1647.21	−0.06	+0.24
250	1153.51	1676.73	1154.21	1677.57	+0.70	+0.84
251	1188.66	1483.60	1188.33	1483.81	−0.33	+0.21
252	1208.24	1662.84	1208.80	1660.99	+0.56	−1.85
253	1214.81	1482.60	1215.49	1482.44	+0.68	−0.16
254	+1222.82	+1621.46	+1222.11	+1621.93	−0.71	+0.47
255	1233.52	1725.80	1233.44	1726.30	−0.08	+0.50
256	1245.66	1773.61	1245.61	1773.69	−0.05	+0.08
257	1247.08	1726.15	1247.35	1725.39	+0.27	−0.76
258	1248.26	1536.08	1248.58	1536.09	+0.32	+0.01
259	+1257.16	+1382.20	+	+		
260	1280.72	1488.52	1280.54	1486.88	−0.18	−1.64
261	1281.96	1589.42	1282.25	1589.75	+0.29	+0.33
262	1291.74	1531.03	1291.65	1530.46	−0.09	−0.57
263	1301.23	1473.86	1300.63	1473.34	−0.60	−0.52
264	+1302.33	+1506.51	+1302.91	+1506.90	+0.58	+0.39
265	1304.49	1408.98	1305.26	1409.17	+0.77	+0.19
266	1310.02	1442.24	1309.82	1442.91	−0.20	+0.67
267	1314.01	1448.99	1314.56	1449.49	+0.55	+0.50
268	1352.94	1568.83	1352.65	1570.08	−0.29	+1.25
269	+1353.59	+1555.13	+1353.42	+1555.40	−0.17	+0.27
270	1357.75	1583.87	1358.15	1583.81	+0.40	−0.06
271	1360.40	1497.12	1360.69	1497.61	+0.29	+0.49
272	1365.34	1705.10	1366.15	1703.53	+0.81	−1.57
273	1375.33	1704.51	1375.90	1705.44	+0.57	+0.93

TABLE 14

SECTION III. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
274	19.0	+37.0872	+37.7244	+37.1098	+37.7464
275	13.5	37.4625	39.4592	37.4831	39.4544
276	17.3	37.5532	37.5936	37.5594	37.5868
277	14.5	38.3937	41.7574	38.3994	41.7618
278	13.7	38.7070	37.8429	38.7313	37.8528
279	15.5	+38.7488	+38.8422	+38.7516	+38.8404
280	17.9	39.3992	45.8224	39.4446	45.8198
281	14.7	39.6925	40.2979	39.6958	40.3156
282	17.9	39.8870	43.7296	39.8888	43.7044
283	17.9	40.6880	37.4739		
284	17.9	+40.8155	+44.1409	+40.8181	+44.1408
285	19.0	40.8670	42.9936		
286	14.7	41.5198	45.0712	41.5278	45.0458
287	19.0	41.6125	36.7272	41.6064	36.6874
288	16.2	42.0542	37.7929	42.0030*	37.8515*
289	12.2	+42.3620	+36.0976	+42.3806	+36.0988
290	16.8	42.3948	43.1109	42.4011	43.0692
291	14.7	42.4872	44.7254	42.4851	44.7248
292	12.8	42.6105	43.4256	42.6281	43.4431
293	17.7	43.3048	38.3122	43.2671	38.2834
294	14.5	+43.4238	+35.5744	+43.4261	+35.5626
295	17.9	43.4890	39.4256	43.5094	39.3838
296	17.3	43.7245	44.3494	43.7394	44.3636
297	14.3	43.7745	45.9174	43.7778	45.9146
298	17.9	44.1067	38.4704	44.0734	38.4586
299	15.7	+45.1002	+42.8789	+45.1034	+42.8858
300	16.2	45.2927	36.4929	45.3094	36.4871
301	16.8	45.3602	40.6549	45.3406	40.6696
302	16.8	45.4480	43.3739	45.4676	43.4046
303	16.8	45.6815	43.4759	45.6921	43.4914
304	15.7	+45.7388	+40.9022	+45.7292	+40.8824
305	14.5	45.9030	36.6324	45.9124	36.6294
306	17.0	45.9955	40.6549	46.0192	40.6348
307	17.5	46.2610	43.7322	46.2696	43.7188
308	14.0	46.4358	36.4179	46.4491	36.4156
309	19.0	+46.8202	+44.5542	+46.8054	+44.5166
310	15.7	46.9878	42.6126	46.9778	42.6141
311	17.9	47.0330	36.8296	47.0681	36.8231
312	16.8	47.0855	42.3089	47.0928	42.3304
313	13.7	47.4336*	34.6451*	47.4310*	34.6898*

*Measured and reduced with Section XIII.

TABLE 14

SECTION III. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
274	+1407.15	+1432.43	+1407.72	+1433.47	+0.57	+1.04
275	1421.39	1498.23	1421.89	1498.25	+0.50	+0.02
276	1424.83	1427.50	1424.77	1427.45	−0.06	−0.05
277	1456.70	1585.42	1456.65	1585.78	−0.05	+0.36
278	1468.59	1437.03	1469.23	1437.61	+0.64	+0.58
279	+1470.18	+1474.92	+1470.00	+1475.05	−0.18	+0.13
280	1494.83	1739.61	1496.32	1739.69	+1.49	+0.08
281	1505.97	1530.17	1505.82	1531.03	−0.15	+0.86
282	1513.34	1660.30	1513.16	1659.52	−0.18	−0.78
283	1543.73	1423.17				
284	+1548.56	+1675.95	+1548.41	+1676.12	−0.15	+0.17
285	1550.51	1632.45				
286	1575.27	1711.27	1575.33	1710.47	+0.06	−0.80
287	1578.80	1394.92	1578.28	1393.60	−0.52	−1.32
288	1595.55	1435.35	1595.81	1435.35	+0.26	0.00
289	+1607.23	+1371.09	+1607.64	+1371.33	+0.41	+0.24
290	1608.46	1637.00	1608.45	1635.59	−0.01	−1.41
291	1611.96	1698.22	1611.64	1698.36	−0.32	+0.14
292	1616.64	1648.95	1617.06	1649.78	+0.42	+0.83
293	1642.99	1455.12	1641.28	1454.21	−1.71	−0.91
294	1647.50	1351.33	1647.30	1351.07	−0.20	−0.26
295	1649.97	1497.35	1650.47	1495.94	+0.50	−1.41
296	1658.89	1684.04	1659.22	1684.75	+0.33	+0.71
297	1660.79	1743.50	1660.68	1743.55	−0.11	+0.05
298	1673.40	1461.17	1671.86	1460.90	−1.54	−0.27
299	1711.08	1628.38	1710.95	1628.81	−0.13	+0.43
300	1718.39	1386.27	1718.74	1386.23	+0.35	−0.04
301	1720.94	1544.08	1719.94	1544.80	−1.00	+0.72
302	1724.27	1647.17	1724.77	1648.50	+0.50	+1.33
303	1733.12	1651.05	1733.28	1651.80	+0.16	+0.75
304	1735.30	1553.48	1734.68	1552.89	−0.62	−0.59
305	1741.54	1391.60	1741.61	1391.67	+0.07	+0.07
306	1745.04	1544.12	1745.68	1543.52	+0.64	−0.60
307	1755.10	1660.81	1755.19	1660.46	+0.09	−0.35
308	1761.75	1383.50	1761.97	1383.59	+0.22	+0.09
309	1776.31	1692.01	1775.52	1690.73	−0.79	−1.28
310	1782.67	1618.41	1782.05	1618.62	−0.62	+0.21
311	1784.40	1399.15	1785.45	1399.08	+1.05	−0.07
312	1786.38	1606.90	1786.41	1607.87	+0.03	+0.97
313	1801.00	1314.00	1801.50	1315.30	+0.50	+1.30

TABLE 14

SECTION III. MEASURED COORDINATES—CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
314	16.8	+47.5420	+43.0536	+47.5431	+43.0236
315	16.8	47.9535	43.6156	47.9576	43.5658
316	14.6	48.2340	35.4746	48.2344	35.4559
317	16.8	48.2500	43.8916	48.2848	43.8884
318	16.8	48.4130	37.4915	48.4314	37.4908
319	19.0	+48.6248	+39.9874	+48.6618	+39.9324
320	16.2	48.7806*	47.1263*	48.7670*	47.1292*
321	15.7	49.0358	45.8132	49.0378	45.8218
322	17.9	49.1178	42.3686	49.1301	42.3504
323	16.8	49.1722	46.4556	48.8466	47.0904
324	15.2	+49.3605	+40.6074	+49.3708	+40.5928
325	16.8	49.3845	37.9714	49.3684	37.9431
326	16.8	49.5637	45.4104	49.5824	45.4051
327	16.5	49.5665	41.9204	49.5464	41.9064
328	16.5	49.8792	42.9419	49.8964	42.9258
329	13.5	+50.4622	+42.2162	+50.4566	+42.2134
330	15.7	50.7480	44.7854	50.7686	44.7906
331	10.9	50.8310	39.5139	50.8306	39.5214
332	14.7	50.8970	42.6444	50.9144	42.6366
333	17.9	51.0142	44.6942	51.0301	44.6908
334	16.2	+51.7825	+40.2874	+51.7974	+40.2856
335	17.9	51.7862	39.6886	51.7908	39.6524
336	14.3	51.9448	37.6484	51.9516	37.6614
337	16.4	53.7062	35.5359	53.7226	35.5401
338	16.8	53.8338	37.2792	53.8636	37.2808
339	14.5	+53.9935	+35.6529	+54.0134	+35.6658
340	15.7	54.1315	39.0712	54.1438	39.0666
341	17.3	54.4960	35.8566	54.5094	35.8366

*Measured and reduced with Section XIII.

SECTION IV. MEASURED COORDINATES

342	15.5	+ 8.9728	+41.0134	+ 8.9938	+40.9988
343	16.2	9.9185	41.6528	9.9140	41.6362
344	16.8	10.1610	41.6191	10.1435	41.6060
345	14.1	10.7918	44.7658	10.7900	44.7452
346	15.7	10.8718	42.5941	10.8628	42.5822

TABLE 14

SECTION III. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
314	1803.69	1635.16	1803.49	1634.18	−0.20	−0.98
315	1819.30	1656.50	1819.22	1654.76	−0.08	−1.74
316	1829.96	1347.85	1829.68	1347.32	−0.28	−0.53
317	1830.55	1666.98	1831.63	1667.01	+1.08	+0.03
318	1836.74	1424.23	1837.16	1424.48	+0.42	+0.25
319	1844.77	1518.98	1845.91	1517.06	+1.14	−1.92
320	1852.47	1787.41	1852.99	1787.15	+0.52	−0.26
321	1860.35	1739.89	1860.20	1740.35	−0.15	+0.46
322	1863.46	1609.29	1863.69	1608.75	+0.23	−0.54
323	1865.52	1764.25				
324	1872.67	1542.53	1872.81	1542.14	+0.14	−0.39
325	1873.59	1442.59	1872.71	1441.68	−0.88	−0.91
326	1880.37	1724.65	1880.86	1724.59	+0.49	−0.06
327	1880.48	1592.33	1879.48	1591.95	−1.00	−0.38
328	1892.34	1631.08	1892.76	1630.62	+0.42	−0.46
329	1914.46	1603.60	1914.00	1603.64	−0.46	+0.04
330	1925.29	1701.03	1925.85	1701.37	+0.56	+0.34
331	1928.45	1501.17	1928.18	1501.61	−0.27	+0.44
332	1930.95	1619.86	1931.37	1619.71	+0.42	−0.15
333	1935.39	1697.59	1935.77	1697.60	+0.38	+0.01
334	1964.54	1530.56	1964.85	1530.64	+0.31	+0.08
335	1964.68	1507.86	1964.60	1506.63	−0.08	−1.23
336	1970.70	1430.51	1970.69	1431.16	−0.01	+0.65
337	2037.51	1350.53	2037.86	1350.85	+0.35	+0.32
338	2042.35	1416.64	2043.21	1416.85	+0.86	+0.21
339	2048.41	1354.99	2048.89	1355.63	+0.48	+0.64
340	2053.64	1484.60	2053.85	1484.57	+0.21	−0.03
341	2067.47	1362.74	2067.70	1362.14	+0.23	−0.60

SECTION IV. REDUCED COORDINATES

342	+ 340.72	+1555.56	+ 341.49	+1555.58	+0.77	+0.02
343	376.59	1579.85	376.40	1579.79	−0.19	−0.06
344	385.79	1578.58	385.11	1578.66	−0.68	+0.08
345	409.71	1697.93	409.66	1697.74	−0.05	−0.19
346	412.75	1615.62	412.40	1615.71	−0.35	+0.09

TABLE 14

SECTION IV. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
347	15.5	+11.4318	+51.3654	+11.4135	+51.3592
348	14.2	11.7042	51.6618	11.7062	51.6452
349	11.2	11.8930	41.4101	11.9045	41.3985
350	15.7	12.5558	37.8866	12.5522	37.8600
351	14.3	12.6235	46.3231	12.6292	46.3192
352	13.9	+12.8785	+37.9901	+12.8875	+37.9690
353	16.8	13.2532	47.7921	13.2482	47.7948
354	14.9	13.8588	38.8294	13.8632	38.8095
355	13.3	14.2212	47.2008	14.2302	47.1945
356	14.7	14.4720	40.9386	14.4800	40.9350
357	15.1	+14.5573	+46.4436	+14.5562	+46.4425
358	15.3	14.7810	47.6196	14.7875	47.6172
359	14.5	15.7838	47.2371	15.7915	47.2238
360	16.8	15.7952	50.6954	15.7918	50.6835
361	15.0	16.2328	46.2296	16.2380	46.2205
362	15.5	+16.2990	+51.2931	+16.2882	+51.2740
363	11.2	16.8435	46.4636	16.8560	46.4595
364	14.0	16.9562	44.5203	16.9655	44.5178
365	15.7	17.0808	49.5591	17.0888	49.5342
366	13.3	17.3462	50.8484	17.3548	50.8525
367	13.7	+17.4372	+41.2898	+17.4477	+41.2890
368	15.7	17.4778	45.5541	17.4742	45.5432
369	16.2	17.7348	52.8838	17.7370	52.8672
370	15.2	17.9932	37.3431	18.0026	37.3130
371	14.2	18.0448	37.8196	18.0595	37.8105
372	13.3	+18.1525	+49.9791	+18.1522	+49.9608
373	15.7	18.4732	36.1564	18.4785	36.1415
374	16.6	18.5885	35.9724	18.5952	35.9538
375	12.3	19.2230	53.4641	19.2148	53.4652
376	16.3	19.8572	35.7913	18.8452	35.7827
377	13.5	+19.9055	+43.4946	+19.9220	+43.4980
378	16.2	20.1170	45.2408	20.1355	45.2152
379	13.7	20.6814	49.2401	20.6800	49.2182
37	10.4	20.8082	51.0274	20.7920	51.0230
380	12.8	21.2205	44.2968	21.2185	44.2870
381	15.5	+21.5272	+50.8441	+21.5230	+50.8335
382	15.9	21.9820	42.4368	22.0132	42.4310
383	16.8	22.0149	45.8811	22.0502	45.8435
384	13.5	22.2700	45.0651	22.2775	45.0528
385	14.5	22.8910	46.7428	22.9032	46.7350

TABLE 14
SECTION IV. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
347	+ 433.96	+1948.20	+ 433.37	+1948.60	−0.59	+0.40
348	444.29	1959.46	444.48	1959.46	+0.19	0.00
349	451.50	1570.74	451.91	1570.85	+0.41	+0.11
350	476.67	1437.16	476.45	1436.68	−0.22	−0.48
351	479.19	1757.06	479.44	1757.50	+0.25	+0.44
352	+ 488.91	+1441.10	+ 489.17	+1440.82	+0.26	−0.28
353	503.08	1812.80	502.94	1813.49	−0.14	+0.69
354	526.10	1472.97	526.19	1472.74	+0.09	−0.23
355	539.80	1790.42	540.18	1790.76	+0.38	+0.34
356	549.35	1552.98	549.60	1553.37	+0.25	+0.39
357	+ 552.56	+1761.72	+ 552.54	+1762.25	−0.02	+0.53
358	561.04	1806.33	561.33	1806.81	+0.29	+0.48
359	599.09	1791.87	599.41	1791.93	+0.32	+0.06
360	599.50	1923.00	599.45	1923.14	−0.05	+0.14
361	616.13	1753.69	616.34	1753.89	+0.21	+0.20
362	+ 618.61	+1945.69	+ 618.28	+1945.55	−0.33	−0.14
363	639.30	1762.59	639.78	1762.98	+0.48	+0.39
364	643.58	1688.91	643.92	1689.35	+0.34	+0.44
365	648.28	1879.98	648.64	1879.60	+0.36	−0.38
366	658.34	1928.88	658.74	1929.61	+0.40	+0.73
367	+ 661.85	+1566.44	+ 662.18	+1566.91	+0.33	+0.47
368	663.37	1728.13	663.22	1728.25	−0.15	+0.12
369	673.08	2006.08	673.26	2006.03	+0.18	−0.05
370	682.96	1416.81	683.20	1416.14	+0.24	−0.67
371	684.92	1434.88	685.36	1435.01	+0.44	+0.13
372	+ 688.94	+1895.95	+ 688.98	+1895.82	+0.04	−0.13
373	701.18	1371.83	701.24	1371.73	+0.06	−0.10
374	705.55	1364.86	705.66	1364.61	+0.11	−0.25
375	729.54	2028.15	729.32	2028.77	−0.22	+0.62
376	715.75	1358.01	715.14	1358.13	−0.61	+0.12
377	+ 755.48	+1650.16	+ 756.06	+1650.78	+0.58	+0.62
378	763.50	1716.38	764.17	1715.92	+0.67	−0.46
379	784.89	1868.05	784.86	1867.75	−0.03	−0.30
37	789.69	1935.83	789.13	1936.21	−0.56	+0.38
380	805.37	1680.64	805.25	1680.75	−0.12	+0.11
381	+ 816.97	+1928.91	+ 816.86	+1929.05	−0.11	+0.14
382	834.27	1610.14	835.38	1610.39	+1.11	+0.25
383	835.50	1740.75	836.81	1739.82	+1.31	−0.93
384	845.18	1709.82	845.43	1709.84	+0.25	+0.02
385	868.73	1773.46	869.18	1773.66	+0.45	+0.20

TABLE 14

SECTION IV. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
386	14.7	+23.3995	+47.5898	+23.4045	+47.5718
387	15.7	23.8695	54.2956	23.8485	54.2655
388	14.9	24.4145	50.8756	24.4045	50.8455
389	13.3	25.5902	40.9386	25.6015	40.9325
390	15.9	25.8160*	36.6819*	25.9095	36.6615
391	12.5	+26.0030	+45.4891	+26.0163	+45.4870
392	16.8	27.2880	42.7198	27.2862	42.7210
393	14.2	27.8375	47.3798	27.8375	47.3850

*Measured and reduced with Section XIII.

SECTION V. MEASURED COORDINATES

394	19.0	−14.7492	+21.7762	−14.7466	+21.7466
395	16.2	14.5652	22.5180	14.5813	22.4741
396	17.3	13.5894	23.4088	13.6244	23.3494
397	17.0	13.5266	20.1042	13.5401	20.0398
398	16.8	13.1446	23.9815	13.1854	23.9728
399	11.9	−11.0414	+22.7710	−11.0414	+22.7351
400	17.0	8.9476	20.4412	8.9471	20.4068
401	13.5	8.9176	19.6045	8.8981	19.5798
402	17.6	8.8282	24.4000	8.8524	24.3751
403	17.6	8.7016	18.3982	8.7344	18.3728
404	14.2	− 6.8527	+19.7855	− 6.8646	+19.7724
405	10.2	6.4864	21.1240	6.5098	21.1064
406	13.7	6.3022	19.9740	6.3198	19.9516
407	17.1	3.9816	23.0380	3.9874	23.0096
408	16.8	3.7702	21.5252	3.7751	21.4836
409	17.9	− 1.0464	+24.3275	− 1.0641	+24.3066
410	16.5	+ 0.1142	22.7272	+ 0.1042	22.7131
411	10.8	0.6666	20.5322	0.6696	20.5158
412	11.9	2.5628	20.6137	2.5674	20.6074
413	12.8	2.9263	19.1502	2.9259	19.1516
414	14.7	+ 3.2436	+19.3932	+ 3.2496	+19.3666
415	16.2	5.5808	19.7122	5.5964	19.7011
416	14.7	7.8121	26.2235	7.7864	26.2158
417	14.9	8.0386	20.3900	8.0482	20.3681
418	17.1	8.1681	23.3235	8.1612	23.3044
419	15.2	+ 8.8011	+21.3337		
420	16.8	8.8756	20.1435	+ 8.8694	+20.1354
421	13.3	9.7486	22.5657	9.7456	22.5778
422	13.3	9.7628	26.0840	9.7539	26.0816
423	14.7	9.9754	23.5177	9.9646	23.4941

TABLE 14

SECTION IV. REDUCED COORDINATES - CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
386	+ 888.02	+1805.60	+ 888.20	+1805.42	+0.18	−0.18
387	905.81	2059.90	905.10	2059.30	−0.71	−0.60
388	926.51	1930.24	926.16	1929.61	−0.35	−0.63
389	971.17	1553.50	971.48	1553.70	+0.31	+0.20
390	980.98	1391.26	983.13	1391.73	+2.15	+0.47
391	+ 986.80	+1726.07	+ 987.26	+1726.45	+0.46	+0.38
392	1035.57	1621.12	1035.41	1621.59	−0.16	+0.47
393	1056.39	1797.85	1056.36	1798.50	−0.03	+0.65

SECTION V. REDUCED COORDINATES

394	− 559.34	+ 824.34	− 559.03	+ 824.50	+0.31	+0.16
395	552.38	852.47	552.75	853.10	−0.37	+0.63
396	515.39	886.31	516.45	885.32	−1.06	−0.99
397	512.93	761.03	513.29	759.82	−0.36	−1.21
398	498.53	908.06	499.79	908.98	−1.26	+0.92
399	− 418.74	+ 862.31	− 418.48	+ 862.12	+0.26	−0.19
400	339.27	774.12	339.07	773.91	+0.20	−0.21
401	338.11	742.39	337.22	742.55	+0.89	+0.16
402	334.84	924.22	335.43	924.39	−0.59	+0.17
403	329.89	696.67	331.03	696.78	−1.14	+0.11
404	− 259.80	+ 749.40	− 260.09	+ 749.92	−0.29	+0.52
405	245.94	800.17	246.61	800.52	−0.67	+0.35
406	238.93	756.58	239.42	756.74	−0.49	+0.16
407	150.99	872.91	150.92	872.79	+0.07	−0.12
408	142.93	815.57	142.88	814.93	+0.05	−0.64
409	− 39.69	+ 922.00	− 40.02	+ 922.08	−0.33	+0.08
410	+ 4.36	861.40	+ 4.28	861.69	−0.08	+0.29
411	25.37	778.22	25.70	778.39	+0.33	+0.17
412	97.28	781.44	97.68	781.93	+0.40	+0.49
413	111.10	725.97	111.26	726.74	+0.16	+0.77
414	+ 123.13	+ 735.21	+ 123.54	+ 734.90	+0.41	−0.31
415	211.77	747.46	212.56	747.67	+0.79	+0.21
416	296.24	994.48	295.71	994.80	−0.53	+0.32
417	304.97	773.33	305.57	773.05	+0.60	−0.28
418	309.81	884.57	309.89	884.41	+0.08	−0.16
419	+ 333.86	+ 809.16				
420	336.72	764.04	+ 336.71	+ 764.26	−0.01	+0.22
421	369.77	855.93	369.98	856.91	+0.21	+0.98
422	370.23	989.33	370.33	989.78	+0.10	+0.45
423	378.35	892.04	378.30	891.67	−0.05	−0.37

TABLE 14

SECTION V. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
424	14.7	+10.8224	+25.4185	+10.8079	+25.4111
425	11.3	13.0361	23.4745	13.0044	23.4846
426	15.7	13.1624	25.8028	13.1700	25.7871
427	14.3	14.0742	22.7675	14.0702	22.7771
428	16.5	14.1738	21.4898	14.1694	21.4856
429	14.9	+15.0828	+23.9665	+15.0719	+23.9638
430	16.2	15.3056	25.6248	15.2914	25.6108
431	15.5	15.3601	26.1565	15.3509	26.1541
432	17.9	15.6668	24.5570	15.6876	24.5516
433	16.8	15.8006	26.0768	15.7719	26.0461
434	13.0	+15.9278	+22.7608	+15.9229	+22.7521
435	11.6	16.2411	21.7390	16.2322	21.7323
436	11.9	16.3914	23.1350	16.3759	23.1423
437	14.7	16.4922	21.9830	16.4849	21.9711
438	16.2	17.9768	22.5058	17.9769	22.4904
439	17.9	+18.8776	+21.9475	+18.8806	+21.9358
440	17.9	19.0596	22.7057	19.0386	22.6958
441	17.6	19.0926	22.9838	19.0961	22.9911
442	16.0	19.6896	22.2715	19.6876	22.2588
443	15.4	20.2866	26.9085	20.2479	26.8866
444	16.8	+20.7588	+23.1677	+20.7522	+23.1471
445	18.4	20.9106	22.6245	20.8976	22.6376
446	16.5	21.0278	22.9652	21.0072	22.9566
447	14.2	21.3906	22.8135	21.3864	22.8101
448		21.9076	26.4272		
449	11.7	+22.5038	+25.4070	+22.4886	+25.4126
450	13.5	22.6138	24.0548	22.6076	24.0628
451	15.2	22.9454	26.5108	22.9186	26.5058
452	10.5	23.4334	22.2372	23.4239	22.2546
453	16.8	23.7568	23.5532	23.7762	23.5454
454	14.7	+23.8566	+24.6808	+23.8452	+24.6773
455	14.9	25.4064	25.6305	25.4020	25.6356
456	15.2	25.8538	22.9628	25.8396	22.9481
457	14.2	26.1424	24.6535	26.1319	24.6716
458	16.5	26.9516	24.6172	26.9539	24.5878
459	16.8	+27.1834	+24.2310	+27.1662	+24.2256
460		29.5636	21.7148		
461	17.9	29.6841	25.6932	29.6714	25.6936
462	14.7	29.9646	22.4260	29.9636	22.4326

TABLE 14

SECTION V. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
424	+ 410.43	+ 964.17	+ 410.31	+ 964.39	−0.12	+0.22
425	494.43	890.61	493.60	891.41	−0.83	+0.80
426	499.17	978.89	499.91	978.73	+0.74	−0.16
427	533.82	863.88	534.01	864.62	+0.19	+0.74
428	537.63	815.44	537.76	815.65	+0.13	+0.21
429	+ 572.05	+ 909.40	+ 572.02	+ 909.66	−0.03	+0.26
430	580.46	972.29	580.37	972.13	−0.09	−0.16
431	582.51	992.45	582.63	992.73	+0.12	+0.28
432	594.18	931.83	595.38	931.97	+1.20	+0.14
433	599.22	989.46	598.60	988.65	−0.62	−0.81
434	+ 604.12	+ 863.75	+ 604.29	+ 863.74	+0.17	−0.01
435	616.03	825.03	616.01	825.08	−0.02	+0.05
436	621.70	877.97	621.47	878.56	−0.23	+0.59
437	625.55	834.30	625.59	834.15	+0.04	−0.15
438	681.84	854.22	682.19	853.89	+0.35	−0.33
439	+ 716.02	+ 833.11	+ 716.46	+ 832.90	+0.44	−0.21
440	722.91	861.87	722.47	861.72	−0.44	−0.15
441	724.15	872.42	724.65	872.92	+0.50	+0.50
442	746.81	845.45	747.08	845.17	+0.27	−0.28
443	769.34	1021.30	768.39	1020.69	−0.95	−0.61
444	+ 787.34	+ 879.50	+ 787.47	+ 878.90	+0.13	−0.60
445	793.11	858.92	792.98	859.58	−0.13	+0.66
446	797.55	871.84	797.14	871.68	−0.41	−0.16
447	811.31	866.12	811.52	866.14	+0.21	+0.02
448	830.83	1003.16				
449	+ 853.47	+ 964.52	+ 853.36	+ 964.87	−0.11	+0.35
450	857.67	913.26	857.86	913.69	+0.19	+0.43
451	870.19	1006.40	869.68	1006.34	−0.51	−0.06
452	888.80	844.40	888.80	845.15	0.00	+0.75
453	901.04	894.32	902.18	894.11	+1.14	−0.21
454	+ 904.79	+ 937.08	+ 904.81	+ 937.04	+0.02	−0.04
455	963.55	973.19	963.87	973.43	+0.32	+0.24
456	980.58	872.08	980.43	871.53	−0.15	−0.55
457	991.49	936.20	991.54	936.90	+0.05	+0.70
458	1022.18	934.88	1022.72	933.75	+0.54	−1.13
459	+1030.98	+ 920.25	+1030.77	+ 920.03	−0.21	−0.22
460	1121.31	825.01				
461	1125.79	975.86	1125.81	975.79	+0.02	−0.07
462	1136.51	852.01	1136.85	852.14	+0.34	+0.13

TABLE 14
SECTION VI. MEASURED COORDINATES

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
463	16.0	−17.5522	+29.6862	−17.5512	+29.6614
464	15.5	16.9439	30.6390	16.9672	30.5899
465	14.0	16.9034	29.5215	16.9335	29.5049
466	16.2	16.6992	27.0998	16.7332	27.0600
467	19.0	16.4962	28.8926		
468	17.8	−16.1689	+26.3710	−16.2015	+26.3329
469	17.8	15.9432	30.0210		
470	16.4	14.2624	29.0943	−14.2822	29.0896
471	17.9	13.4076	29.8851	13.4197	29.8716
472	17.3	13.1796	25.9468	13.1965	25.8887
473	16.1	−11.6982	+28.8560	−11.7125	+28.8222
474	16.5	11.2012	29.2525	11.2158	29.1932
475	14.4	11.1879	29.0432	11.2020	29.0020
476	16.8	10.9972	27.4732	11.0095	27.4229
477		10.6024	30.0215		
478	14.4	− 9.6114	+32.4963		
479	16.0	9.5504	28.7305	− 9.5672	+28.6814
480	16.0	8.9242	30.0712	8.9767	30.0278
481	13.9	8.3592	25.2437	8.3792	25.2282
482	15.0	8.1762	32.7395	8.2298*	32.6860*
483	16.2	− 7.3579	+28.6775	− 7.4060	+28.6594
484	19.0	6.8484	30.0090	6.8795	29.9839
485	14.2	6.7262	24.5520	6.7345	24.5332
486	15.7	6.3672	29.4176	6.3808	29.3672
487	13.3	6.3376	25.0205	6.3408	25.0132
488	11.9	− 5.9834	+25.7884	− 5.9992	+25.7764
489	16.2	6.1227	29.7318	6.1355	29.7046
490	13.9	5.5496	26.2900	5.5728	26.2621
491	11.7	4.3549	32.3658	4.4165*	32.3338*
492	13.7	3.9684	28.2085	3.9880	28.1984
493	15.4	− 3.6894	+26.2368	− 3.6895	+26.2221
494	15.0	3.0572	29.1635	3.0815	29.1509
495	14.7	1.6166	28.8752	1.6378	28.8636
496		0.8992	25.4777		
497	11.9	0.4446	29.9048	0.4715	29.8887
498	15.4	− 0.0886	+25.6215	− 0.1148	+25.6082
499	17.1	+ 1.0743	28.4252	+ 1.0530	28.3964
500	18.4	1.2548	31.8930	1.2510	31.8746
501	17.1	1.3428	26.5837	1.3520	26.5512
502	18.4	1.4561	32.7350	1.4362	32.7536

*Measured and reduced with Section XIII.

TABLE 14
SECTION VI. REDUCED COORDINATES

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
463	− 665.79	+1124.29	− 665.17	+1124.44	+0.62	+0.15
464	642.74	1160.46	643.01	1159.68	−0.27	−0.78
465	641.18	1118.09	641.74	1118.53	−0.56	+0.44
466	633.39	1026.28	634.18	1025.82	−0.79	−0.46
467	625.73	1094.27				
468	− 613.27	+ 998.68	− 614.02	+ 998.28	−0.75	−0.40
469	604.77	1137.10				
470	541.00	1102.08	541.19	1102.90	−0.19	+0.82
471	508.59	1132.12	508.46	1132.60	+0.13	+0.48
472	499.87	982.80	500.05	981.56	−0.18	−1.24
473	− 443.74	+1093.22	− 443.73	+1092.88	+0.01	−0.34
474	424.89	1108.29	424.88	1106.97	+0.01	−1.32
475	424.38	1100.36	424.36	1099.72	+0.02	−0.64
476	417.12	1040.84	417.08	1039.84	+0.04	−1.00
477	402.19	1137.49				
478	− 364.65	+1231.40				
479	362.27	1088.61	− 362.36	+1087.63	−0.09	−0.98
480	338.54	1139.50	339.94	1138.72	−1.40	−0.78
481	317.02	956.48	317.34	956.73	−0.32	+0.25
482	310.21	1240.73	309.95	1240.47	+0.26	−0.26
483	− 279.10	+1086.76	− 280.39	+1086.90	−1.29	+0.14
484	259.80	1137.28	260.40	1137.15	−0.60	−0.13
485	255.07	930.37	254.97	930.45	+0.10	+0.08
486	241.54	1114.89	241.49	1113.78	+0.05	−1.11
487	240.34	948.16	240.03	948.67	+0.31	+0.51
488	− 226.92	+ 977.31	− 227.07	+ 977.63	−0.15	+0.32
489	232.27	1126.82	232.19	1126.59	+0.08	−0.23
490	210.47	996.36	210.89	996.07	−0.42	−0.29
491	165.27	1226.83	165.33	1227.03	+0.06	+0.20
492	150.53	1069.21	150.75	1069.57	−0.22	+0.36
493	− 139.91	+ 994.47	− 139.46	+ 994.63	+0.45	+0.16
494	115.99	1105.49	116.36	1105.73	−0.37	+0.24
495	61.34	1094.66	61.60	1094.90	−0.26	+0.24
496	34.08	965.88				
497	16.90	1133.78	17.35	1133.82	−0.45	+0.04
498	− 3.32	+ 971.39	− 3.87	+ 971.51	−0.55	+0.12
499	+ 40.74	1077.79	+ 40.45	1077.30	−0.29	−0.49
500	47.52	1209.29	48.00	1209.21	+0.48	−0.08
501	50.95	1007.98	51.77	1007.34	+0.82	−0.64
502	55.14	1241.23	55.04	1242.55	−0.10	+1.32

TABLE 14

SECTION VI. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
503	17.1	+ 1.5213	+27.1633	+ 1.5042	+27.1354
504	14.2	1.6351	26.3645	1.6240	26.3454
505	17.6	1.9053	32.0528	1.8835	32.0176
506	19.0	2.5318	30.1125	2.4777	30.1125
507	19.0	3.5261	32.7785		
508	13.7	+ 5.1146	+30.6910	+ 5.0932	+30.6866
509	15.2	5.5588	30.1230	5.5480	30.1114
510	17.9	6.6218	28.2677	6.5635	28.2614
511	15.7	6.6421	26.6508	6.6325	26.6469
512	17.9	6.8546	26.8408	6.8630	26.8274
513	15.5	+ 7.0891	+29.4340	+ 7.0752	+29.4216
514	13.4	7.3571	29.0665	7.3567	29.0572
416	14.7	7.7993	26.2278	7.7798	26.2196
515	17.3	8.7151	30.9370	8.6802	30.9244
516	17.9	8.7151	28.7880	8.6957	28.8126
517	11.9	+ 8.8404	+29.7908	+ 8.8240	+29.7822
518	11.6	9.0768	31.5985	9.0610	31.6074
519	18.4	10.5878	32.5065		
520	16.6	10.6301	30.9938	10.6035	30.9899
521	15.2	10.9764	29.2198	10.9635	29.2172
522	13.1	+11.4718	+32.5162	+11.4805	+32.5214
523	15.4	12.2758	27.1888	12.2757	27.1864
524	14.9	12.4938	31.5605	12.4828	31.5594
525	15.5	13.8184	27.8418	13.8135	27.8392
526	16.2	14.0511	32.4960	14.0632	32.4864
527	14.4	+16.5856	+32.9128	+16.5977	+32.9276
529	17.9	17.2008	30.1338	17.1802	30.1264
530	16.0	17.3901	29.9228	17.3788	29.9154
531	17.3	17.4791	31.1968	17.4660	31.1584
532	16.8	17.9071	28.8960	17.8845	28.9016
533	15.7	+18.0794	+29.6992	+18.0705	+29.6812
534	15.5	18.1156	27.1822	18.1110	27.1829
535	17.3	18.4371	32.8062	18.4200	32.8006
536	17.3	18.8038	32.9019	18.8222	32.9006
537	11.2	18.9464	28.5660	18.9432	28.5705
538	13.3	+19.3646	+30.8045	+19.3602	+30.8187
539	19.0	20.0448	31.0922	20.0690	31.0689
540	17.3	20.2751	30.7885	20.2672	30.7716
541	19.5	20.5108	31.0018	20.5320	30.9892
542	15.7	21.3971	32.0162	21.3911	32.0344

Star 528 was rejected, owing to uncertainty of measures.

TABLE 14

SECTION VI. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
503	+ 57.71	+1029.97	+ 57.55	+1029.50	−0.16	−0.47
504	62.04	999.69	62.08	999.55	+0.04	−0.14
505	72.19	1215.40	72.00	1214.66	−0.19	−0.74
506	95.99	1141.87	94.51	1142.44	−1.48	+0.57
507	133.66	1243.03				
508	+ 193.94	+1163.99	+ 193.72	+1164.33	−0.22	+0.34
509	210.80	1142.48	210.96	1142.54	+0.16	+0.06
510	251.16	1072.21	249.45	1072.43	−1.71	+0.22
511	251.95	1010.90	252.05	1011.20	+0.10	+0.30
512	260.01	1018.12	260.80	1018.06	+0.79	−0.06
513	+ 268.86	+1116.46	+ 268.88	+1116.45	+0.02	−0.01
514	279.03	1102.55	279.55	1102.64	+0.52	+0.09
416	295.85	994.94	295.56	995.05	−0.29	+0.11
515	330.51	1173.57	329.77	1173.51	−0.74	−0.06
516	330.55	1092.08	330.33	1093.42	−0.22	+1.34
517	+ 335.28	+1130.12	+ 335.21	+1130.20	−0.07	+0.08
518	344.22	1198.68	344.22	1199.43	0.00	+0.75
519	401.51	1233.21				
520	403.14	1175.86	402.72	1176.08	−0.42	+0.22
521	416.31	1108.61	416.35	1108.87	+0.04	+0.26
522	+ 435.04	+1233.64	+ 436.00	+1234.20	+0.96	+0.56
523	465.63	1031.69	466.10	1031.92	+0.47	+0.23
524	473.82	1197.48	474.01	1197.76	+0.19	+0.28
525	524.13	1056.56	524.43	1056.74	+0.30	+0.18
526	532.88	1233.06	533.96	1232.98	+1.08	−0.08
527	+ 629.00	+1249.04	+ 630.10	+1249.83	+1.10	+0.79
529	652.39	1143.71	652.16	1143.63	−0.23	−0.08
530	659.57	1135.72	659.69	1135.63	+0.12	−0.09
531	662.92	1184.04	663.01	1182.78	+0.09	−1.26
532	679.20	1096.83	678.85	1097.21	−0.35	+0.38
533	+ 685.72	+1127.29	+ 685.92	+1126.78	+0.20	−0.51
534	687.14	1031.86	687.42	1032.04	+0.28	+0.18
535	699.23	1245.13	699.22	1245.09	−0.01	−0.04
536	713.14	1248.79	714.47	1248.90	+1.33	+0.11
537	718.63	1084.39	719.01	1084.70	+0.38	+0.31
538	+ 734.45	+1169.30	+ 734.85	+1169.98	+0.40	+0.68
539	760.24	1180.25	761.74	1179.50	+1.50	−0.75
540	768.98	1168.75	769.25	1168.23	+0.27	−0.52
541	777.92	1176.86	779.30	1176.50	+1.38	−0.36
542	811.52	1215.38	811.90	1216.17	+0.38	+0.79

TABLE 14

SECTION VI. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
543	Nova (?)	+	+	+21.8028	+32.0769
544	14.4	21.8241	29.4465	21.8215	29.4482
545	15.5	22.0796	31.7920	22.0585	31.7876
546	18.4	22.4131	33.9705	22.4008	33.9462
547	13.3	22.6981	30.8282	22.6920	30.8321
548	15.2	+25.9443	+31.9198	+25.8988*	+31.9470*
549	17.3	26.3726	33.1968		
550	17.4	26.8588	32.9892	26.8140	32.9764
551	19.0	27.3758	32.4770	27.3708	32.4629
552	17.3	27.6708	32.3318	27.6535	32.3309
553		+28.0926	+31.9022	+	+
554	15.2	29.2856	28.6742	29.2632	28.6814

*Measured and reduced with Section XIII.

SECTION VII. MEASURED COORDINATES

555	16.2	+17.1382	+20.9206	+17.1504	+20.9106
556	16.2	17.3292	15.2874	17.3227	15.2818
557	16.8	17.4252	13.5452		
558	15.1	17.7462	17.6082	17.7540	17.6111
559	15.6	17.8755	12.8154	17.8820	12.8108
560	17.1	+17.9658	+18.6669	+17.9630	+18.6738
561	16.8	18.2280	19.6476	18.2160	19.6596
562	15.3	18.7232	15.5329	18.7250	15.5228
563	17.1	19.3900	12.0752	19.3937	12.0748
564	16.8	20.0635	8.5374	20.0387	8.5191
565	17.9	+20.1272	+20.1064		
566	16.8	20.3247	20.7402	+20.3154	+20.7276
36	10.1	20.3285	19.6029	20.3330	19.6228
567	14.2	22.2690	8.3686	22.2782	8.3651
568	16.2	23.2192	19.0294	23.2154	19.0136
569	17.9	+23.3095	+14.1739		
570	15.2	23.7402	4.9389	+23.7420	+ 4.9328
571	16.2	23.9872	4.7979	23.9727	4.7846
572	14.4	23.9890	19.5609	23.9830	19.5484
573	17.9	24.1292	21.2534	24.1564	21.2421

TABLE 14

SECTION VII. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
543	+	+	+ 827.51	+1217.80		
544	827.76	1117.98	828.19	1118.11	+0.43	+0.13
545	837.41	1206.93	837.21	1206.84	−0.20	−0.09
546	850.02	1289.56	850.22	1288.72	+0.20	−0.84
547	860.89	1170.43	861.22	1170.63	+0.33	+0.20
548	+ 984.00	+1212.05	+ 984.56	+1211.71	+0.56	−0.34
549	1000.22	1260.50				
550	1018.67	1252.66	1017.59	1252.14	−1.08	−0.52
551	1038.28	1233.28	1038.70	1232.69	+0.42	−0.59
552	1049.48	1227.79	1049.42	1227.69	−0.06	−0.10
553	+1065.48	+1211.53				
554	1110.79	1089.22	+1110.43	+1089.37	−0.36	+0.15

SECTION VII. REDUCED COORDINATES

555	+ 650.57	+ 794.26	+ 650.98	+ 793.99	+0.41	−0.27
556	657.79	580.68	657.48	580.54	−0.31	−0.14
557	661.42	514.63				
558	673.62	668.69	673.86	668.89	+0.24	+0.20
559	678.50	486.97	678.68	486.86	+0.18	−0.11
560	+ 681.96	+ 708.84	+ 681.80	+ 709.20	−0.16	+0.36
561	691.91	746.04	691.41	746.59	−0.50	+0.55
562	710.68	590.04	710.69	589.74	+0.01	−0.30
563	735.97	458.96	736.03	459.01	+0.06	+0.05
564	761.50	324.85	760.48	324.20	−1.02	−0.65
565	+ 763.98	+ 763.51				
566	771.47	787.54	+ 771.07	+ 787.17	−0.40	−0.37
36	771.61	744.42	771.73	745.27	+0.12	+0.85
567	845.18	318.53	845.45	318.45	+0.27	−0.08
568	881.29	722.79	881.09	722.28	−0.20	−0.51
569	+ 884.60	+ 538.69				
570	900.99	188.55	+ 900.97	+ 188.35	−0.02	−0.20
571	910.36	183.21	909.72	182.73	−0.64	−0.48
572	910.50	742.97	910.22	742.59	−0.28	−0.38
573	915.83	807.15	916.81	806.82	+0.98	−0.33

TABLE 14

SECTION VII. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
574	15.5	+24.4665	+13.5219	+24.4567	+13.5201
575	17.9	25.1782	9.7786		
576	16.8	25.3475	18.8582	25.3594	18.8526
577	15.7	25.6268	10.1716	25.6372	10.1500
578	16.8	25.8592	5.9364		
579	15.7	+25.8890	+ 7.9269	+25.8787	+ 7.9254
580	14.7	26.1700	7.3466		
581	14.7	26.2998	9.4289	26.3117	9.4218
582	17.9	26.3838	9.9124	26.3794	9.8968
583	17.9	26.5000	6.4804	26.5140	6.4821
584	15.5	+26.6268	+17.5596	+26.6235	+17.5588
585	16.2	26.7750	6.1432	26.7802	6.1321
586	15.2	26.9730	14.8999	26.9790	14.8974
587	17.1	27.3058	15.7714		
588	15.2	27.3920	19.9099	27.3977	19.9001
589	17.9	+27.8455	+16.7994		
590	16.8	28.3355	5.6554	+28.3115	+ 5.6324
591	15.0	28.8227	8.0894	28.8257	8.0834
592	16.0	28.8418	16.9264	28.8307	16.9118
593	16.8	29.2797	9.5894	29.2672	9.5526
594	10.4	+29.3280	+15.9569	+29.3230	+15.9662
595	16.8	29.9100	9.4059	29.9122	9.3856
596	17.9	29.9452	8.0686		
597	15.7	30.1837	9.5454	30.1742	9.5466
598	15.0	30.5080	11.0592	30.5187	11.0604
599	15.1	+30.7018	+14.5852	+30.7074	+14.5901
600	18.0	30.8768	16.2074		
601	18.0	31.2205	15.7286	31.1950	15.7274
602	13.7	31.2895	10.5116	31.2882	10.5141
603	15.5	31.2912	17.3334	31.2822	17.3284
604	16.6	+31.5198	+14.8136	+31.5092	+14.8066
605	17.1	31.9550	15.1949	31.9340	15.2096
606	16.5	32.4532	9.1334	32.4402	9.1254
607	16.5	33.1015	7.6474	33.0837	7.6248
608	16.5	33.2345	19.7774	33.2354	19.7671
609	18.0	+33.5837	+17.1006		
610	17.9	33.6120	17.6739	33.5942	17.6504
611	15.7	33.8918	16.9669		
612	15.2	33.9450	17.2619	33.9467	17.2766
613	15.2	34.6125	12.2214	34.6150	12.2311

TABLE 14

SECTION VII. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V—III	V—III
	″	″	″	″	″	″
574	+ 928.59	+ 514.01	+ 928.15	+ 514.01	−0.44	0.00
575	955.58	372.10				
576	962.04	716.38	962.44	716.26	+0.40	−0.12
577	972.60	387.02	972.92	386.26	+0.32	−0.76
578	981.40	226.45				
579	+ 982.54	+ 301.92	+ 982.06	+ 301.91	−0.48	−0.01
580	993.19	279.93				
581	998.13	358.89	998.50	358.67	+0.37	−0.22
582	1001.32	377.22	1001.08	376.68	−0.24	−0.54
583	1005.71	247.10	1006.16	247.20	+0.45	+0.10
584	+1010.58	+ 667.19	+1010.39	+ 667.24	−0.19	+0.05
585	1016.14	234.32	1016.25	233.94	+0.11	−0.38
586	1023.70	566.35	1023.86	566.33	+0.16	−0.02
587	1036.33	606.99				
588	1039.62	756.33	1039.79	756.06	+0.17	−0.27
589	+1056.82	+ 638.41				
590	1075.35	215.89	+1074.35	+ 215.05	−1.00	−0.84
591	1093.85	308.19	1093.88	308.01	+0.03	−0.18
592	1094.62	643.26	1094.14	642.79	−0.48	−0.47
593	1111.20	365.09	1110.64	363.74	−0.56	−1.35
594	+1113.06	+ 606.52	+1112.81	+ 606.95	−0.25	+0.43
595	1135.11	358.15	1135.12	357.43	+0.01	−0.72
596	1136.44	307.45				
597	1145.50	363.45	1145.06	363.55	−0.44	+0.10
598	1157.81	420.86	1158.14	420.97	+0.33	+0.11
599	+1165.18	+ 554.56	+1165.33	+ 554.82	+0.15	+0.26
600	1171.83	616.08				
601	1184.87	597.94	1183.84	597.97	−1.03	+0.03
602	1187.46	400.13	1187.33	400.28	−0.13	+0.15
603	1187.56	658.79	1187.16	658.68	−0.40	−0.11
604	+1196.22	+ 563.25	+1195.75	+ 563.06	−0.47	−0.19
605	1212.73	577.73	1211.87	578.36	−0.86	+0.63
606	1231.61	347.92	1231.03	347.66	−0.58	−0.26
607	1256.20	291.60	1255.44	290.78	−0.76	−0.82
608	1261.31	751.53	1261.29	751.23	−0.02	−0.30
609	+1274.54	+ 650.05	+	+		
610	1275.62	671.78	1274.88	670.98	−0.74	−0.80
611	1286.23	644.99				
612	1288.25	656.18	1288.26	656.82	+0.01	+0.64
613	1313.55	465.08	1313.58	465.51	+0.03	+0.43

TABLE 14

SECTION VII. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
614	14.2	+35.1952	+18.1952	+35.1967	+18.2004
615	17.7	35.4918	18.9789	35.5057	18.9976
616	11.2	35.6027	8.7646	35.5807	8.7696
617	16.8	35.8162	6.9936	35.8032	6.9721
618	16.0	35.8212	20.5494	35.8287	20.5331
619	17.9	+36.0112	+10.9409	+36.0004	+10.9386
620	16.0	36.3660	20.0372	36.3697	20.0218
621	11.6	36.4170	12.1672	36.4107	12.1736
622	14.4	36.5847	17.7189	36.5772	17.7151
623	16.5	36.7198	10.0666	36.7362	10.0558
624	16.0	+37.2288	+20.8724	+37.2140	+20.8521
625	15.2	38.1672	19.2679	38.1757	19.2621
626	15.4	38.4512	7.8119	38.4425	7.8046
627	10.6	38.6802	14.3102	38.6784	14.3181

MEASURES REPEATED FROM SECTION IA

52	10.8	+33.3932	+21.8186	+33.3850	+21.8261
75	17.9	37.8990	26.5772	37.9130	26.5684
79	12.8	38.4232	27.7934	38.4215	27.8064
83	13.2	39.3340	26.8724	39.3447	26.8674
93	11.3	41.8938	23.8996	41.9100	23.9126
95	15.2	+43.1880	+25.9409	+43.1944	+25.9231
96	16.8	43.5870	25.2396	43.5784	25.2314
97	17.9	43.7698	24.8466	43.7235	24.8294
102	15.7	46.6402	28.3332	46.6197	28.3321

MEASURES REPEATED FROM SECTION IB

114	16.2	+16.2822	+ 7.2784	+16.3020	+ 7.2514
115	15.5	16.4890	6.5549	16.5064	6.5541
116	14.0	17.0280	6.6589	17.0390	6.6641
117	15.2	17.1328	7.0989	17.1450	7.0931
125	16.0	19.7335	7.2526	19.7380	7.2504
129	14.7	+20.7902	+ 6.4356	+20.7972	+ 6.4291

TABLE 14

SECTION VII. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
614	+1335.69	+ 691.61	+1335.69	+ 691.90	0.00	+0.29
615	1346.95	721.34	1347.42	722.14	+0.47	+0.80
616	1351.11	334.05	1350.19	334.29	−0.92	+0.24
617	1359.20	266.91	1358.62	266.13	−0.58	−0.78
618	1359.46	780.90	1359.69	780.38	+0.23	−0.52
619	+1366.62	+ 416.58	+1366.13	+ 416.55	−0.49	−0.03
620	1380.13	761.50	1380.21	761.01	+0.08	−0.49
621	1382.02	463.10	1381.71	463.40	−0.31	+0.30
622	1388.41	673.60	1388.07	673.55	−0.34	−0.05
623	1393.50	383.46	1394.04	383.11	+0.54	−0.35
624	+1412.87	+ 793.20	+1412.25	+ 792.53	−0.62	−0.67
625	1448.46	732.40	1448.73	732.27	+0.27	−0.13
626	1459.18	298.04	1458.77	297.80	−0.41	−0.24
627	1467.90	544.44	1467.77	544.81	−0.13	+0.37

MEASURES REPEATED FROM SECTION IA

52	+1267.34	+ 828.93	+1266.98	+ 829.32	−0.36	+0.39
75	1438.32	1009.53	1438.82	1009.32	+0.50	−0.21
79	1458.22	1055.66	1458.12	1056.29	−0.10	+0.63
83	1492.77	1020.78	1493.14	1020.71	+0.37	−0.07
93	1589.89	908.15	1590.46	908.76	+0.57	+0.61
95	+1639.00	+ 985.60	+1639.21	+ 985.05	+0.21	−0.55
96	1654.14	959.03	1653.77	958.84	−0.37	−0.19
97	1661.07	944.13	1659.27	943.60	−1.87	−0.53
102	1770.00	1076.44	1769.19	1076.53	−0.81	+0.09

MEASURES REPEATED FROM SECTION IB

114	+ 618.02	+ 276.97	+ 618.69	+ 275.99	+0.67	−0.98
115	625.86	249.54	626.44	249.55	+0.58	+0.01
116	646.32	253.51	646.65	253.74	+0.33	+0.23
117	650.30	270.19	650.67	270.02	+0.37	−0.17
125	748.97	276.12	749.06	276.08	+0.09	−0.04
129	+ 789.06	+ 245.18	+ 789.24	+ 244 97	+0.18	−0.21

TABLE 14

SECTION VII. MEASURED COORDINATES — CONTINUED

MEASURES REPEATED FROM SECTION V

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
430	16.2	+15.2892	+25.6236	+15.3042	+25.5966
431	15.5	15.3442	26.1706	15.3590	26.1551
432	17.9	15.6595	24.5416	15.6909	24.5596
435	11.6	15.7890	26.0772	15.7772	26.0481
436	11.9	16.3648	23.1354	16.3804	23.1434
447	14.2	+21.3688	+22.8114	+21.3922	+22.8134
449	11.7	22.4878	25.4094	22.4990	25.4161
450	13.5	22.5968	24.0606	22.6067	24.0614
452	10.5	23.4130	22.2446	23.4282	22.2638
456	15.2	25.8468	22.9746	25.8437	22.9501
457	14.2	+26.1290	+24.6739	+26.1387	+24.6598

MEASURES REPEATED FROM SECTION X

17	10.9	−28.4982	−19.7228	−28.4970	−19.7179
840	14.7	21.4142	19.3448	21.4098	19.3494
843	13.1	20.8785	18.8191	20.8717	18.8126
845	16.6	20.0885	17.3831	20.0813	17.3954
847	16.8	19.1455	17.5678	19.1488	17.5974
849	14.7	−18.7380	−16.7951	−18.7320	−16.7949
855	15.9	15.9050	17.1398	15.9093	17.1654
856	13.9	14.7882	17.6106	14.7713	17.6222
859	17.3	13.8298	18.9028	13.8233	18.9399
862	16.2	12.9982	19.1241	12.9848	19.1354
867	17.3	−11.1952	−19.3153	−11.2243	−19.3409
879	15.2	7.0318	17.6968	7.0305	17.7076

MEASURES REPEATED FROM SECTION XII

1116	11.7	−29.9692	−51.9414	−29.9388	−51.9546
1117	14.2	29.9360	53.4111	29.9233	53.4249
1118	15.2	29.8150	54.7166	29.7948	54.7452
1119	15.5	29.8102	53.7251	29.7983	53.7574

TABLE 14

SECTION VII. REDUCED COORDINATES — CONTINUED

MEASURES REPEATED FROM SECTION V

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V—III	V—III
	″	″	″	″	″	″
430	+ 580.44	+ 972.51	+ 580.97	+ 971.61	+0.53	−0.90
431	582.53	993.26	583.05	992.79	+0.52	−0.47
432	594.48	931.50	595.63	932.30	+1.15	+0.80
435	599.40	989.73	598.92	988.75	−0.48	−0.98
436	621.24	878.21	621.78	878.63	+0.54	+0.42
447	+ 811.10	+ 866.12	+ 811.94	+ 866.30	+0.84	+0.18
449	853.57	964.67	853.96	965.04	+0.39	+0.37
450	857.70	913.53	858.03	913.67	+0.33	+0.14
452	888.66	844.70	889.19	845.54	+0.53	+0.84
456	981.01	872.47	980.85	871.66	−0.16	−0.81
457	+ 991.73	+ 936.92	+ 992.05	+ 936.50	+0.32	−0.42

MEASURES REPEATED FROM SECTION X

17	−1081.22	− 748.52	−1081.32	− 748.41	−0.10	+0.11
840	812.43	733.92	812.40	734.17	+0.03	−0.25
843	792.10	713.96	791.98	713.79	+0.12	+0.17
845	762.11	659.49	761.98	660.02	+0.13	−0.53
847	726.34	666.45	726.60	667.64	−0.26	−1.19
849	− 710.87	− 637.14	− 710.78	− 637.20	+0.09	−0.06
855	603.38	650.10	603.68	651.14	−0.30	−1.04
856	561.01	667.91	560.51	668.42	+0.50	−0.51
859	524.65	716.87	524.55	718.35	+0.10	−1.48
862	493.10	725.23	492.73	725.73	+0.37	−0.50
867	− 424.69	− 732.41	− 425.94	− 733.46	−1.25	−1.05
879	266.71	670.89	266.80	671.36	−0.09	−0.47

MEASURES REPEATED FROM SECTION XII

1116	−1137.19	−1970.19	−1136.26	−1970.90	+0.93	−0.71
1117	1135.94	2025.91	1135.69	2026.66	+0.25	−0.75
1118	1131.35	2075.41	1130.82	2076.72	+0.53	−1.31
1119	1131.17	2037.81	1130.95	2039.26	+0.22	−1.45

TABLE 14

SECTION VII. MEASURED COORDINATES — CONTINUED

MEASURES REPEATED FROM SECTION XIII

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
1193	15.2	−38.4400	−44.0928	−38.4330	−44.0999
1199	15.2	37.7075	43.7151	37.6990	43.7382
1201	14.5	37.5082	43.0178	37.4953	43.0189
1204	14.5	36.0422	42.6376	36.0173	42.6442
1211	15.7	35.6668	44.7181	35.6448	44.7336
1220	16.8	−35.1840	−45.3321		
1221		34.1785	43.6828	−34.1660	−43.7164
1225	15.5	33.2830	46.4776	33.2805	46.4804

SECTION VIII. MEASURED COORDINATES

628		−16.5228	+17.5211		
629	17.9	16.3905	14.7628	−16.3963	+14.7409
630		15.7422	16.8806		
631	15.0	15.5142	10.1391	15.5083	10.1299
632	15.2	15.0042	13.1764	14.9916	13.1352
633	15.2	−14.8058	+14.8041	−14.8026	+14.7975
634	16.8	13.2600	15.8088	13.2613	15.8022
635	16.0	13.2355	15.0731	13.2293	15.0525
636	14.7	12.9628	10.4131	12.9656	10.3957
637	16.8	12.8598	17.0558	12.8620	17.0485
638	14.5	−12.5355	+15.7061	−12.5265	+15.7085
639	16.8	11.9308	12.2491	11.9516	12.2282
640	14.7	11.5260	16.1031	11.5271	16.0907
641	16.8	11.4518	17.4143	11.4560	17.4112
642	16.8	11.4078	10.1243	11.3877	10.1115
643	16.2	−10.9112	+15.8308	−10.9198	+15.8069
644	15.0	10.8532	16.2716	10.8473	16.2695
645	17.9	10.1112	17.3696	10.1113	17.3557
646	15.7	9.9560	16.3661	9.9433	16.3559
647	13.2	9.8662	14.2604	9.8446	14.2717
648	17.9			− 9.8520	+12.7525
649	17.3	− 8.3842	+14.7028	8.3638	14.7089
650	17.9	7.8330	12.0331	7.8446	12.0172
651	14.3	7.7858	17.1496	7.7726	17.1482
652	16.8	6.4815	8.8964	6.5018	8.8837

TABLE 14

SECTION VII. REDUCED COORDINATES — CONTINUED

MEASURES REPEATED FROM SECTION XIII

NO.	PLATE III		PLATE V		V_X V—III	V_Y V—III
	X	Y	X	Y		
	″	″	″	″	″	″
1193	−1458.56	−1672.92	−1458.50	−1673.37	+0.06	−0.45
1199	1430.76	1658.57	1430.65	1659.63	+0.11	−1.06
1201	1423.20	1632.12	1422.91	1632.34	+0.29	−0.22
1204	1367.57	1617.65	1366.83	1618.08	+0.74	−0.43
1211	1353.34	1696.52	1352.71	1697.29	+0.63	−0.77
1220	−1335.02	−1719.78				
1221	1296.86	1657.21	−1296.59	−1658.67	+0.27	−1.46
1225	1262.90	1763.14	1263.02	1763.45	−0.12	−0.31

SECTION VIII. REDUCED COORDINATES

628	− 626.70	+ 663.99				
629	621.69	559.41	− 621.98	+ 558.76	−0.29	−0.65
630	597.08	639.73				
631	588.46	384.13	588.32	383.94	+0.14	−0.19
632	569.10	499.31	568.70	497.92	+0.40	−1.39
633	− 561.56	+ 561.04	− 561.52	+ 560.96	+0.04	−0.08
634	502.90	599.19	503.03	599.12	−0.13	−0.07
635	501.98	571.30	501.83	570.69	+0.15	−0.61
636	491.66	394.62	491.85	394.11	−0.19	−0.51
637	487.71	646.49	487.88	646.40	−0.17	−0.09
638	− 475.41	+ 595.32	− 475.16	+ 595.59	+0.25	+0.27
639	452.49	464.27	453.37	463.64	−0.88	−0.63
640	437.11	610.41	437.24	610.13	−0.13	−0.28
641	434.29	660.13	434.53	660.20	−0.24	+0.07
642	432.65	383.72	432.00	383.39	+0.65	−0.33
643	− 413.78	+ 600.11	− 414.20	+ 599.39	−0.42	−0.72
644	411.58	616.83	411.45	616.93	+0.13	+0.10
645	383.42	658.49	383.52	658.15	−0.10	−0.34
646	377.54	620.45	377.15	620.24	+0.39	−0.21
647	374.14	540.61	373.42	541.21	+0.72	+0.60
648			− 373.72	+ 483.60		
649	− 317.91	+ 557.44	317.24	557.85	+0.67	+0.41
650	297.01	456.23	297.57	455.79	−0.56	−0.44
651	295.19	650.24	294.79	650.37	+0.40	+0.13
652	245.74	337.35	246.65	337.02	−0.91	−0.33

TABLE 14

SECTION VIII. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
653	14.7	− 5.8190	+ 9.7936	− 5.8193	+ 9.7869
654	13.0	5.6520	13.3918	5.6220	13.3979
655	17.5	5.1330	16.4931	5.1130	16.4825
656	17.9	4.7835	12.6378	4.7986	12.6209
657	17.9	3.9090	11.8206	3.9270	11.7971
658	17.9	− 3.8280	+13.3848	− 3.8185	+13.3784
659	17.3	3.4040	14.7726	3.3866	14.7612
660	15.7	2.3550	15.7514	2.3500	15.7490
661	16.2	0.3752	15.3678	0.3675	15.4002
662	15.7	0.3490	12.3164	0.3330	12.3109
663	15.5	− 0.2380	+13.5224	− 0.2200	+13.5142
664	16.8	+ 0.0453*	15.8459*	+ 0.0737	15.8435
665	16.4	0.1080	14.9928	0.0960	14.9839
666	16.8	0.6635	9.9838	0.6670	9.9659
667	16.5	0.9478	15.2011	0.9660	15.2089
668	12.8	+1.1475	+16.6666	+1.1602	+16.6685
669	15.7	1.6280	16.2571	1.6290	16.2329
670	15.7	1.9452	14.4711	1.9487	14.4382
671	14.4	2.3358	17.8466	2.3282	17.8437
672	16.0	2.7425	16.9144	2.7567	16.9062
673	15.7	+ 4.1938	+14.0428	+ 4.1827	+14.0402
674	16.8	6.0098	12.3573	6.0470	12.3802
675	14.7	6.3570	17.6731	6.3697	17.6752
676	17.9	7.9248	16.8431	7.9607	16.8509
677	14.9	8.9568	14.4064	8.9740	14.4037
678	14.5	+ 9.2852	+15.7254	+ 9.2954	+15.7195
679	16.8	9.6142	17.7264	9.6090	17.7299
680	16.2	9.7805	12.5350	9.8057	12.5182
681	17.9	11.0535	10.6516	11.0770	10.6759
682	16.2	11.1260	10.4103		
683	14.0	+11.3275	+20.5781	+11.3500	+20.5712
684	15.7	11.4582	18.0001	11.4352	17.9889
685	16.0	11.8720	10.3504	11.8744	10.3517
686	13.1	12.2750	16.4361	12.2922	16.4492
33	11.5	13.4780	10.0601	13.4835	10.0707
687	16.8	+14.4288	+11.4316	+14.4532	+11.4415
688	14.2	14.9810	9.4214	14.9915	9.4245
689	11.4	15.0388	18.6218	15.0420	18.6297
690	14.7	15.0595	20.1268	15.0490	20.0729
691	16.5	16.2420	8.6478	16.2705	8.6582

*Measured and reduced with Section XIII.

TABLE 14

SECTION VIII. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
653	− 220.60	+ 371.40	− 220.75	+ 371.30	−0.15	−0.10
654	214.25	507.83	213.24	508.24	+1.01	+0.41
655	194.54	625.44	193.90	625.23	+0.64	−0.21
656	181.30	479.28	182.00	478.80	−0.70	−0.48
657	148.12	448.33	148.94	447.60	−0.82	−0.73
658	− 145.04	+ 507.64	− 144.81	+ 507.56	+0.23	−0.08
659	128.94	560.27	128.42	560.02	+0.52	−0.25
660	89.14	597.43	89.09	597.52	+0.05	+0.09
661	14.02	582.96	13.88	584.36	+0.14	+1.40
662	13.04	467.26	12.59	467.22	+0.45	−0.04
663	− 8.82	+ 512.99	− 8.29	+ 512.85	+0.53	−0.14
664	+ 2.72	600.97	+ 2.86	601.19	+0.14	+0.22
665	4.31	568.76	3.70	568.60	−0.61	−0.16
666	25.36	378.85	25.33	378.33	−0.03	−0.52
667	36.18	576.69	36.71	577.16	+0.53	+0.47
668	+ 43.76	+ 632.26	+ 44.09	+ 632.52	+0.33	+0.26
669	61.99	616.75	61.87	616.02	−0.12	−0.73
670	74.02	549.05	73.99	547.97	−0.03	−1.08
671	88.86	677.05	88.41	677.13	−0.45	+0.08
672	104.28	641.72	104.66	641.59	+0.38	−0.13
673	+ 159.34	+ 532.89	+ 158.74	+ 532.96	−0.60	+0.07
674	228.23	469.05	229.45	470.09	+1.22	+1.04
675	241.43	670.62	241.73	670.89	+0.30	+0.27
676	300.91	639.21	302.09	639.69	+1.18	+0.48
677	340.06	546.86	340.51	546.93	+0.45	+0.07
678	+ 352.53	+ 596.88	+ 352.71	+ 596.84	+0.18	−0.04
679	365.02	672.77	364.63	673.09	−0.39	+0.32
680	371.30	475.93	372.05	475.46	+0.75	−0.47
681	419.60	404.57	420.27	405.65	+0.67	+1.08
682	422.34	395.42				
683	+ 430.04	+ 780.96	+ 430.70	+ 780.90	+0.66	−0.06
684	434.99	683.21	433.91	682.98	−1.08	−0.23
685	450.65	393.18	450.52	393.38	−0.13	+0.20
686	465.97	623.94	466.41	624.62	+0.44	+0.68
33	511.58	382.23	511.56	382.79	−0.02	+0.56
687	+ 547.67	+ 434.27	+ 548.36	+ 434.81	+0.69	+0.54
688	568.61	358.07	568.76	358.34	+0.15	+0.27
689	570.85	706.92	570.75	707.41	−0.10	+0.49
690	571.64	763.99	571.02	762.14	−0.62	−1.85
691	616.45	328.79	617.28	329.33	+0.83	+0.54

TABLE 14

SECTION VIII. MEASURED COORDINATES — CONTINUED

MEASURES REPEATED FROM SECTION IB

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
114	16.4	+16.2888	+ 7.2781	+16.3027	+ 7.2327
115	15.5	16.4960	6.5516	16.5092	6.5535
116	14.0	17.0235	6.6591	17.0410	6.6662

MEASURES REPEATED FROM SECTION V

395	16.2	−14.5690	+22.4898	−14.5710	+22.4759
396	17.3	13.5925	23.3748	13.6023	23.3557
397	17.0	13.5205	20.0728	13.5393	20.0342
398	16.8	13.1282	23.9621	13.1633	23.9575
400	17.0	8.9405	20.4134	8.9393	20.4085
401	13.5	− 8.9222	+19.5818	− 8.8823	+19.5819
403	17.6	8.7058	18.3751	8.7278	18.3765
404	14.2	6.8608	19.7721	6.8570	19.7677
405	10.2	6.4920	21.0921	6.4936	21.1062
406	13.7	6.3118	19.9578	6.3138	19.9447
411	10.8	+ 0.6580	+20.5226	+ 0.6692	+20.5222
412	11.9	2.5648	20.5988	2.5662	20.6019
413	12.8	2.9192	19.1498	2.9332	19.1482

MEASURES REPEATED FROM SECTION IX

708	13.5	−15.2292	+ 8.3553	−15.2300	+ 8.3475
715	16.2	13.7010	6.8618	13.6853	6.8562
721	16.8	12.7082	7.4271	12.7260	7.3905
722	16.5	12.6080	5.8831	12.5738	5.8697
725	13.9	11.1092	6.4546	11.0638	6.4422
737	14.0	− 8.1778	+ 7.2274	− 8.1768	+ 7.2227
749	16.8	4.0408	7.4791	4.0170	7.4845
750	15.7	− 3.6342	6.1118	− 3.6470	6.0972
764	13.3	+ 0.7272	8.9626	+ 0.7534	8.9677
805	17.9	9.8170	9.7538		

TABLE 14
SECTION VIII. REDUCED COORDINATES

MEASURES REPEATED FROM SECTION Ib

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
114	+ 618.27	+ 276.86	+ 618.49	+ 275.29	+0.22	−1.57
115	626.13	249.32	626.32	249.52	+0.19	+0.20
116	646.14	253.41	646.50	253.82	+0.36	+0.41

MEASURES REPEATED FROM SECTION V

395	552.49	852.46	552.67	852.14	−0.18	−0.32
396	515.43	886.05	515.91	885.54	−0.48	−0.51
397	− 512.72	+ 760.86	− 513.55	+ 759.59	−0.83	−1.27
398	497.81	908.34	499.26	908.38	−1.45	+0.04
400	338.94	773.94	339.03	773.96	−0.09	+0.02
401	338.25	742.41	336.88	742.61	+1.37	+0.20
403	330.04	696.67	331.02	696.91	−0.98	+0.24
404	260.03	749.71	260.04	749.74	−0.01	+0.03
405	− 246.03	+ 799.77	− 246.24	+ 800.51	−0.21	+0.74
406	239.20	756.77	239.43	756.47	−0.23	−0.30
411	+ 25.26	+ 778.45	+ 25.61	+ 778.97	+0.35	+0.52
412	97.61	781.41	97.46	781.73	−0.15	+0.32
413	111.05	726.48	111.37	726.62	+0.32	+0.14

MEASURES REPEATED FROM SECTION IX

708	− 577.61	+ 316.51	− 577.78	+ 316.36	−0.17	−0.15
715	519.63	259.94	519.19	259.86	+0.44	−0.08
721	481.96	281.41	482.79	280.16	−0.83	−1.25
722	478.16	222.87	477.03	222.50	+1.13	−0.37
725	421.29	244.59	419.74	244.26	+1.55	−0.33
737	− 310.06	+ 274.01	− 310.20	+ 273.97	−0.14	−0.04
749	153.09	283.71	152.39	284.06	+0.70	+0.35
750	137.67	231.88	138.36	231.46	−0.69	−0.42
765	+ 27.83	340.14	+ 28.60	340.48	+0.77	+0.34
805	+ 372.72	370.48				

TABLE 14

SECTION IX. MEASURED COORDINATES

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
692	15.7	−18.9448	+ 4.4072	−18.9256	+ 4.3922
693	16.6	18.6602	+ 2.8388	18.6652	+ 2.8116
694	16.2	18.6125	+ 8.1055	18.5926	+ 8.1042
695	15.7	18.0250	+ 9.3622		
696	17.1	17.7478	+ 1.0198	17.7234	+ 0.9856
697	17.4	−17.4148	− 5.9608	−17.4146	− 5.9658
698	17.9	17.3910	− 1.5290		
699	15.7	16.8722	− 1.2180	16.8562	− 1.2188
700	14.4	16.6522	+ 2.5052	16.6309	+ 2.5032
701	14.7	16.5112	− 3.9300	16.4919	− 3.9324
702	16.2	−16.2645	+ 1.3590	−16.2519	+ 1.3594
703	19.0	15.9895	+ 3.4138	15.9482	+ 3.3929
704	19.0	15.7237	+ 1.0815	15.7194	+ 1.0632
705	13.7	15.7372	+ 3.9382	15.7224	+ 3.9396
706	16.8	15.4418	+ 1.1605	15.4366	+ 1.1439
707	14.5	−15.3402	+ 5.4770	−15.3259	+ 5.4654
708	13.5	15.2435	+ 8.3761	15.2304	+ 8.3649
709	16.6	14.9118	+ 0.9972	14.9022	+ 0.9836
710	14.3	14.6893	+ 0.9128	14.6749	+ 0.9132
711	19.0	14.6610	− 4.2920	14.5976	− 4.2871
712	17.3	−14.1505	− 3.8477	−14.1054	− 3.8471
713	16.8	13.9805	+ 0.5265	13.9814	+ 0.4979
714	15.7	13.8290	− 2.4707	13.8166	− 2.4816
715	16.2	13.7170	+ 6.8782	13.6914	+ 6.8706
716	15.1	13.6515	+ 3.0868	14.6349	+ 3.0764
717	17.9	−13.5037	+ 5.3150	−13.4779	+ 5.3114
718	14.7	13.0610	+ 3.5920	13.0494	+ 3.5854
719	19.0	13.0097	− 5.3108		
720	16.4	13.0062	+ 2.7258	12.9816	+ 2.7156
721	16.8	12.7312	+ 7.4428	12.7284	+ 7.4146
722	16.5	−12.6252	+ 5.8982	−12.5982	+ 5.8809
723	13.5	12.1882	+ 1.2682	12.1779	+ 1.2499
724	17.9	11.5705	− 3.0112	11.5676	− 3.0388
725	13.9	11.1315	+ 6.4715	11.0756	+ 6.4684
726	17.9	10.4340	− 5.6412	10.4702	− 5.6613
727	17.9	−10.3555	+ 0.4022	−10.3354	+ 0.3739
728	16.8	10.2255	+ 1.5510	10.2032	+ 1.5389
729	15.1	9.6480	+ 2.5475	9.6422	+ 2.5412
730	15.0	9.5385	− 3.7010	9.5284	− 3.7191
731	17.9	9.4888	− 6.1385	9.4629	− 6.1298

TABLE 14
SECTION IX. REDUCED COORDINATES

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
692	− 717.95	+ 166.06	− 717.90	+ 165.82	−0.05	−0.24
693	707.15	106.61	708.03	105.92	−0.88	−0.69
694	705.37	306.31	705.25	306.55	+0.12	+0.24
695	683.10	353.99				
696	672.54	37.69	672.32	36.74	+0.22	−0.95
697	− 659.86	− 226.97	− 660.63	− 226.75	−0.77	+0.22
698	658.99	− 58.93				
699	639.31	− 47.10	639.43	− 46.78	−0.12	+0.32
700	630.99	+ 94.08	630.87	+ 94.33	+0.12	+0.25
701	625.61	− 149.91	625.63	− 149.63	−0.02	+0.28
702	− 616.28	+ 50.64	− 616.50	+ 50.99	−0.22	+0.35
703	605.86	128.57	604.98	128.09	+0.88	−0.48
704	595.77	40.15	596.31	39.79	−0.54	−0.36
705	596.30	148.47	596.41	148.82	−0.11	+0.35
706	585.08	43.16	585.58	42.86	−0.50	−0.30
707	− 581.25	+ 206.83	− 581.36	+ 206.68	−0.11	−0.15
708	577.60	+ 316.76	577.73	+ 316.60	−0.13	−0.16
709	564.98	+ 37.00	565.31	+ 36.81	−0.33	−0.19
710	556.54	+ 33.82	556.69	+ 34.15	−0.15	+0.33
711	555.43	− 163.53	553.78	− 162.98	+1.65	+0.55
712	− 536.07	− 146.65	− 535.11	− 146.27	+0.96	+0.38
713	529.65	+ 19.21	530.39	+ 18.44	−0.74	−0.77
714	523.89	− 94.42	524.15	− 94.49	−0.26	−0.07
715	519.70	+ 260.06	519.36	+ 260.04	+0.34	−0.02
716	517.19	+ 116.31	517.26	+ 116.21	−0.07	−0.10
717	− 511.60	+ 200.80	− 511.27	+ 200.94	+0.33	+0.14
718	494.80	+ 135.50	495.03	135.53	−0.23	+0.03
719	492.80	− 202.06				
720	492.71	+ 102.66	492.46	102.56	+0.25	−0.10
721	482.31	+ 281.52	482.83	280.71	−0.52	−0.81
722	− 478.28	+ 222.96	− 477.90	+ 222.57	+0.38	−0.39
723	461.68	+ 47.44	461.98	+ 47.04	−0.30	−0.40
724	438.23	− 114.79	438.85	− 115.50	−0.62	−0.71
725	421.64	+ 244.79	420.15	+ 244.92	+1.49	+0.13
726	395.11	− 214.44	397.24	− 214.86	−2.13	−0.42
727	− 392.17	+ 14.71	− 392.10	+ 13.93	+0.07	−0.78
728	387.25	+ 58.27	387.08	+ 58.10	+0.17	−0.17
729	365.35	+ 96.09	365.80	+ 96.12	−0.45	+0.03
730	361.16	− 140.82	361.51	− 141.19	−0.35	−0.37
731	359.26	− 233.24	359.03	− 232.57	+0.23	+0.67

TABLE 14

SECTION IX. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
732	16.8	− 9.3595	− 5.3928	− 9.3612	− 5.4446
733	13.5	9.3140	+ 2.8992	9.2794	+ 2.8896
734	17.9	8.6422	+ 1.5195	8.6069	+ 1.4894
735	17.9	8.6272	− 5.5580	8.6209	− 5.5993
23	12.8	8.5522	+ 5.8622	8.5476	+ 5.8614
736	17.3	− 8.3855	− 3.0016	− 8.3842	− 2.9923
737	14.0	8.2035	+ 7.2420	8.1809	+ 7.2434
738	14.3	8.1450	+ 5.0905	8.1244	+ 5.0949
739	17.9	8.0752	− 2.5510	8.0492	− 2.5491
740	17.3	7.1325	− 3.5205	7.1199	− 3.5176
741	16.8	− 6.6480	+ 1.5318	− 6.5999	+ 1.4989
652	16.8	6.4952	+ 8.9107	6.5159	+ 8.8979
742	14.5	6.4850	+ 4.9670	6.4679	+ 4.9692
743	16.8	6.0808	+ 0.5228	6.0649	+ 0.5271
744	17.9	5.8840	+ 5.3925	5.8872	+ 5.3676
745	10.6	− 5.6652	− 2.9375	− 5.6499	− 2.9598
746	13.2	5.4442	− 6.6407	5.4182	− 6.6531
747	14.7	4.9488	− 2.6890	4.9246	− 2.7101
748	15.3	4.7298	+ 4.9732	4.7024	+ 4.9604
749	16.8	4.0595	+ 7.4882	4.0322	+ 7.5036
750	15.7	− 3.6585	+ 6.1262	− 3.6446	+ 6.1206
751	13.1	3.1916	− 3.7170	3.1729	− 3.7259
752	16.8	3.0782	+ 4.5440	3.0609	+ 4.5274
753	14.7	2.4645	+ 0.4590	2.4386	+ 0.4464
754	14.4	2.0260	+ 7.5292	2.0016	+ 7.5336
755	17.9	− 1.8458	− 1.0642	− 1.8274	− 1.0533
756	14.3	1.8316	− 6.1032	1.8174	− 6.1166
757	11.7	1.4300	− 6.9140	1.3970*	− 6.9245*
758	17.9	1.3622	− 0.6797	1.3724	− 0.6631
759	16.8	1.1622	+ 5.0202	1.1739	+ 5.0162
760	17.9	− 1.0012	− 0.1662	− 0.9722	− 0.2031
761	17.9	− 0.5602	+ 1.7182	− 0.5264	+ 1.7354
762	16.8	+ 0.0228	+ 3.3900	+ 0.0438	+ 3.3774
763	16.8	0.1400	+ 5.4762	0.1634	+ 5.4714
764	18.0	0.5248	+ 0.5220	0.5774	+ 0.5236
765	13.3	+ 0.7220	+ 8.9725	+ 0.7506	+ 8.9672
766	15.7	0.8878	− 6.0220	0.9038	− 6.0451
767	16.8	1.0135	+ 4.0852		
768	16.8	1.0455	+ 6.1325	1.0428	+ 6.1212
769	15.9	1.6465	− 3.0720	1.6688*	− 3.0928*

*Measured and reduced with Section XIII.

TABLE 14

SECTION IX. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_Y	V_X
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
732	− 354.36	− 204.96	− 355.17	− 206.59	−0.81	−1.63
733	352.68	+ 109.44	352.04	+ 109.35	+0.64	−0.09
734	327.20	+ 57.17	326.53	+ 56.30	+0.67	−0.87
735	326.58	− 211.18	327.10	− 212.41	−0.52	−1.23
23	323.81	+ 221.84	324.27	+ 222.04	−0.46	+0.20
736	− 317.43	− 114.24	− 318.11	− 113.58	−0.68	+0.66
737	310.59	+ 274.18	310.35	+ 274.45	+0.24	+0.27
738	308.36	+ 192.60	308.22	+ 193.01	+0.14	+0.41
739	305.67	− 97.13	305.40	− 96.76	+0.27	+0.37
740	269.91	− 133.84	270.16	− 133.43	−0.25	+0.41
741	− 251.56	+ 57.75	− 250.41	+ 56.77	+1.15	−0.98
652	245.81	+ 337.54	247.19	+ 337.25	−1.38	−0.29
742	245.40	+ 188.01	245.39	+ 188.32	+0.01	+0.31
743	230.04	− 20.12	230.13	− 20.01	−0.09	+0.11
744	222.61	+ 204.18	223.36	+ 203.46	−0.75	−0.72
745	− 214.26	− 111.65	− 214.40	− 112.21	−0.14	−0.56
746	205.86	− 252.05	205.62	− 252.20	+0.24	−0.15
747	187.09	− 102.18	186.89	− 102.70	+0.20	−0.52
748	178.83	+ 188.35	178.43	+ 188.08	+0.40	−0.27
749	153.43	+ 283.75	153.00	+ 284.52	+0.43	+0.77
750	− 138.21	+ 232.13	− 138.30	+ 232.11	−0.09	−0.02
751	120.44	− 141.06	120.45	− 141.12	−0.01	−0.06
752	116.19	+ 172.17	116.17	+ 171.75	+0.02	−0.42
753	92.89	+ 17.32	92.58	+ 17.08	+0.31	−0.24
754	76.30	+ 285.42	75.98	+ 285.76	+0.32	+0.34
755	− 69.42	− 40.40	− 69.41	− 39.74	+0.01	+0.66
756	68.85	− 231.46	69.05	− 231.68	−0.20	−0.22
757	53.61	− 262.18	53.35	− 262.26	+0.26	−0.08
758	51.08	− 25.79	52.15	− 24.93	−1.07	+0.86
759	43.53	+ 190.34	44.59	+ 190.37	−1.06	+0.03
760	− 37.39	− 6.30	− 36.97	− 7.47	+0.42	−1.17
761	− 20.68	+ 65.18	− 20.05	+ 66.04	+0.63	+0.86
762	+ 1.42	+ 128.60	+ 1.57	+ 128.31	+0.15	−0.29
763	+ 5.86	+ 207.71	+ 6.13	+ 207.70	+0.27	−0.01
764	+ 20.48	+ 19.88	+ 21.81	+ 20.16	+1.33	+0.28
765	+ 27.91	+ 340.31	+ 28.42	+ 340.25	+0.51	−0.06
766	+ 34.29	− 228.22	34.16	− 228.83	−0.13	−0.61
767	38.99	+ 155.01				
768	40.19	+ 232.64	39.49	+ 232.37	−0.70	−0.27
769	63.04	− 116.32	63.19	− 116.88	+0.15	−0.56

TABLE 14

SECTION IX. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
770	15.3	+ 1.6518	− 2.2238	+ 1.6692*	− 2.2435*
771	14.7	1.8080	− 5.3475	1.8176	− 5.3628
772	16.1	1.9892	− 4.3565	2.0156	− 4.3806
773	17.9	2.1630	− 3.1192	2.1848*	− 3.1285*
774	16.8	2.5482	+ 4.6562	2.5846	+ 4.6457
775	15.1	+ 2.8462	− 3.0701	+ 2.8736	− 3.0811
776	17.3	2.9485	− 5.9455	2.9708	− 5.9898
777	14.5	2.9632	− 0.1170		
778	19.0	3.6775	+ 2.9802	3.6984	+ 2.9679
779	19.0	3.7392	+ 4.0690		
780	15.7	+ 4.0135	+ 7.1672	+ 4.0498	+ 7.1574
781	14.7	4.1798	+ 5.3052	4.2011	+ 5.3142
782	19.0	4.4942	− 4.7518	4.4988	− 4.7738
783	16.8	4.5920	+ 0.0500	4.6064	+ 0.0402
784				4.8300	+ 3.1994
785	15.1	+ 5.0388	+ 1.0635	+ 5.0561	+ 1.0532
786	16.8	5.1888	− 6.3395	5.2031	− 6.3664
787	16.8	5.2015	− 5.3625	5.2246	− 5.3611
788	19.0	5.2675	+ 8.0220	5.3306	+ 8.0156
789	11.9	5.9865	+ 3.7820	5.9924	+ 3.7762
790	15.2	+ 6.0508	− 3.5540	+ 6.0628	− 3.5618
791	15.4	6.0850	− 6.3077	6.1066	− 6.3204
792	14.5	6.1172	+ 0.7622	6.1401	+ 0.7404
793		6.6280	+ 8.0348		
794	17.1	6.6750	− 3.5252	6.6581	− 3.5358
795	12.5	+ 7.5175	− 3.0853	+ 7.5278	− 3.1048
796	16.8	8.2098	+ 6.3865	8.2238	+ 6.3994
797	19.0	8.2658	+ 2.6900	8.2333	+ 2.6849
798	17.3	8.4872	− 5.7750	8.5591	− 5.8011
799		8.5603	+ 9.4462		
800	17.3	+ 8.6325	+ 7.2360	+ 8.6264	+ 7.2129
801	15.7	8.7132	− 2.2642	8.7436	− 2.2906
802	16.8	8.7422	− 5.3252	8.7664	− 5.3444
803	15.7	9.0152	− 5.7635	9.0216	− 5.7966
804	15.7	9.6048	− 4.1108	9.6071	− 4.1378
805	17.9	+ 9.8152	+ 9.7560		
806	15.7	10.2592	+ 3.2575	+10.2766	+ 3.2422
807	17.9	10.4358	+ 7.3420		
808	17.3	10.6538	+ 8.0190	10.6421	+ 8.0219
809	16.2	10.7570	+ 5.7182	10.7932*	+ 5.7282*

*Measured and reduced with Section XIII.

TABLE 14

SECTION IX. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
770	+ 63.24	− 84.16	+ 63.08	− 84.76	−0.16	−0.60
771	69.18	− 202.59	68.83	− 202.92	−0.35	−0.33
772	76.05	− 165.01	76.34	− 165.68	+0.29	−0.67
773	82.63	− 118.08	82.76	− 118.20	+0.13	−0.12
774	97.20	+ 176.75	97.96	+ 176.52	+0.76	−0.23
775	+ 108.54	− 116.18	+ 108.89	− 116.37	+0.35	−0.19
776	112.44	− 225.20	112.56	− 226.63	+0.12	−1.43
777	112.96	− 4.20				
778	140.04	+ 113.27	140.20	+ 112.97	+0.16	−0.30
779	142.37	+ 154.56				
780	+ 152.75	+ 272.05	+ 153.55	+ 271.81	+0.80	−0.24
781	159.07	+ 201.46	159.28	+ 201.94	+0.21	+0.48
782	171.06	− 179.85	170.52	− 180.46	−0.54	−0.61
783	174.74	+ 2.22	174.63	+ 2.04	−0.11	−0.18
784			183.12	+ 121.81		
785	+ 191.68	+ 40.68	+ 191.69	+ 40.46	+0.01	−0.22
786	197.41	− 240.01	197.23	− 240.79	−0.18	−0.78
787	197.89	− 202.96	198.05	− 202.68	+0.16	+0.28
788	200.31	+ 304.53	202.13	+ 304.40	+1.82	−0.13
789	227.60	+ 143.81	227.21	+ 143.73	−0.39	−0.08
790	+ 230.09	− 134.34	+ 229.85	− 134.43	−0.24	−0.09
791	231.40	− 238.75	231.50	− 239.00	+0.10	−0.25
792	232.58	+ 29.32	232.80	+ 28.66	+0.22	−0.66
793	251.91	+ 305.10				
794	253.76	− 133.21	252.43	− 133.42	−1.33	−0.21
795	+ 285.71	− 116.49	+ 285.42	− 117.03	−0.29	−0.54
796	311.91	+ 242.69	311.86	+ 243.28	−0.05	+0.59
797	314.06	+ 102.54	312.20	+ 102.48	−1.86	−0.06
798	322.50	− 218.41	324.52	− 219.19	+2.02	−0.78
799	325.18	+ 358.72				
800	+ 327.94	+ 274.92	+ 327.13	+ 274.14	−0.81	−0.78
801	331.05	− 85.28	331.54	− 86.11	+0.49	−0.83
802	332.17	− 201.34	332.39	− 201.87	+0.22	−0.53
803	342.53	− 217.95	342.07	− 219.00	−0.46	−1.05
804	364.88	− 155.25	364.28	− 156.09	−0.60	−0.84
805	+ 372.78	+ 370.54				
806	389.65	124.17	+ 389.70	+ 123.71	+0.05	−0.46
807	396.33	279.05				
808	404.59	304.73	403.59	304.91	−1.00	+0.18
809	408.52	217.50	409.87	217.44	+1.35	−0.06

TABLE 14

SECTION IX. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
810	14.0	+ 9.1668	+ 1.1546	+ 9.1816	+ 1.1416
811	15.5	9.6302	+ 2.3145	9.6466	+ 2.3139
812	16.2	9.6497	+ 0.2160	9.6534	+ 0.1974
813	17.9	9.8782	− 0.7881	9.8584	− 0.8176
814	16.8	11.2912	+ 0.4185	11.2891	+ 0.4022
815	15.1	+11.7462	− 1.4538	+11.7514	− 1.4606
816	15.7	12.2952	− 0.9418	12.3001	− 0.9641

SECTION X. MEASURED COORDINATES

817	16.8	−29.4435	−12.4171	−29.4376	−12.4553
818	17.9	28.7200	9.3826	28.7196	9.4646
17	10.4	28.5277	19.6694	28.5142	19.7060
819	17.6	28.1560	11.0228	28.1406	11.0753
820	14.7	27.7345	10.9471	27.7074	10.9948
821	18.3	−26.7560	−17.8914	−26.6974	−17.9606
822	16.2	26.4085	13.7914	26.3822	13.8378
823	16.5	26.2102	18.4496	26.1746	18.4913
824	15.7	26.0875	16.9194	26.0419	16.9455
825	13.3	26.0592	19.2641	26.0359	19.2948
826	19.0	−26.0515	−10.8818		
827	16.8	25.3408	12.5081	−25.3134	−12.5383
828	14.4	25.2430	13.4148	25.2177	13.4340
829	17.9	24.2898	18.4476	24.2814	18.5170
830	15.2	23.6582	13.3504	23.6439	13.3835
831	17.9	−23.3985	−15.2946	−23.3326	−15.3178
832	19.0	23.0645	18.3881	23.0759	18.4340
833	14.2	22.8995	13.1426	22.8686	13.1788
834	17.9	22.8837	16.3708		
835	17.9	22.1877	17.5206	22.1594	17.5848
836	17.9	−22.0607	−16.1911	−21.9842	−16.2664
837	15.2	21.8785	13.1198	21.8422	13.1550
838	17.9	21.7902	15.4356	21.7572	15.4830
839	16.6	21.7850	14.6448	21.7242	14.6650
840	14.7	21.4537	19.3051	21.4166	19.3453

TABLE 14

SECTION IX. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
810	+ 348.24	+ 44.37	+ 348.16	+ 44.02	−0.08	−0.35
811	365.80	+ 88.38	365.81	+ 88.48	+0.01	+0.10
812	366.56	+ 8.81	366.05	+ 8.25	−0.51	−0.56
813	375.23	− 29.25	373.83	− 30.21	−1.40	−0.96
814	428.81	+ 16.59	428.10	+ 16.10	−0.71	−0.49
815	+ 446.08	− 54.38	+ 445.62	− 54.49	−0.46	−0.11
816	466.90	34.93	466.44	35.64	−0.46	−0.71

SECTION X. REDUCED COORDINATES

817	−1116.13	− 472.90	−1116.72	− 472.95	−0.59	−0.05
818	1088.75	357.80	1089.45	359.51	−0.70	−1.71
17	1081.24	747.80	1081.78	747.88	−0.54	−0.08
819	1067.32	419.95	1067.51	420.57	−0.19	−0.62
820	1051.33	417.05	1051.08	417.50	+0.25	−0.45
821	−1014.07	− 680.27	−1012.85	− 681.61	+1.22	−1.34
822	1000.97	524.80	1000.85	525.25	+0.12	−0.45
823	993.35	701.39	993.03	701.71	+0.32	−0.32
824	988.73	643.37	987.98	643.09	+0.75	+0.28
825	987.61	732.26	987.78	732.18	−0.17	+0.08
826	− 987.49	− 414.46				
827	960.49	476.07	− 960.30	− 475.93	+0.19	+0.14
828	956.76	510.44	956.68	509.89	+0.08	+0.55
829	920.50	701.18	921.22	702.61	−0.72	−1.43
830	896.64	507.88	896.99	507.91	−0.35	−0.03
831	− 886.75	− 581.58	− 885.20	− 581.25	+1.55	+0.33
832	874.02	698.84	875.50	699.41	−1.48	−0.57
833	867.86	499.97	867.58	500.12	+0.28	−0.15
834	867.20	622.35				
835	840.77	665.89	840.73	667.17	+0.04	−1.28
836	− 835.98	− 615.48	− 834.07	− 617.17	+1.91	−1.69
837	829.13	499.02	828.65	499.17	+0.48	−0.15
838	825.74	586.81	825.45	587.45	+0.29	−0.64
839	825.55	556.83	824.19	556.43	+1.36	+0.40
840	812.89	733.50	812.57	733.90	+0.32	−0.40

TABLE 14

SECTION X. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
841	13.2	−21.3425	−14.0676	−21.3194	−14.1026
842	16.0	20.9650	9.2021	20.9299	9.2438
843	13.1	20.9185	18.7861	20.8746	18.8206
844	14.7	20.4412	9.0791	20.4169	9.1206
845	16.6	20.1060	17.3561	20.0882	17.4118
846	17.1	−20.0345	−13.5878	−20.0135	−13.6428
847	16.8	19.1812	17.5454	19.1524	17.6003
848	17.1	18.9732	18.7028	18.9942	18.7470
849	14.7	18.7727	16.7636	18.7404	16.8013
850	14.2	18.0665	14.2756	18.0492	14.3006
851	16.6	−18.0597	−13.4061	−18.0304	−13.4480
852	10.9	17.9935	10.9863	17.9649	11.0246
853	16.8	17.0985	8.1826	17.0674	8.2193
854	16.8	16.6207	14.0354	16.5864	14.0843
855	15.9	15.9337	17.1141	15.9176	17.1638
856	13.9	−14.8105	−17.6014	−14.7786	−17.6270
857	17.3	14.3235	14.9498	14.3012	14.9711
21	11.2	14.1485	8.0226	14.1307	8.0426
858	16.8	14.0545	10.6418	14.0236	10.6798
859	17.3	13.8505	18.8938	13.8176	18.9476
860	17.9	−13.7400	− 9.4278	−13.6566	− 9.4883
861	14.5	13.1035	7.6313	13.0759	7.6630
862	16.2	13.0200	19.1038	12.9829	19.1323
863	17.9	12.8118	9.7366	12.7852	9.7596
864	16.2	12.7952	16.6753	12.7494	16.7176
865	17.3	−11.6720	−13.8814	−11.6584	−13.9228
866	16.2	11.6550	13.7088	11.6309	13.7608
867	17.3	11.2365	19.2948	11.2284	19.3580
868	15.0	10.9575	13.1668	10.9129	13.1810
869	16.2	9.9772	19.0306	9.9449	19.0540
870	15.1	− 9.5047	− 9.9821	− 9.4866	− 9.9986
871	15.4	9.4855	8.5664	9.4529	8.5818
872	17.1	8.3920	16.3946	8.3532	16.4343
873	19.0	8.3445	13.9468	8.2782	14.0056
874	19.0	8.2638	9.1201	8.2196	9.1390
875	17.3	− 8.2480	−17.9328	− 8.2049	−17.9328
876	16.2	7.6062	14.8246	7.5776	14.8450
877	16.6	7.3057	17.3861	7.2776	17.4088
878	17.9	7.1820	11.1536	7.1429	11.1903
879	15.2	7.0555	17.7001	7.0239	17.7223

TABLE 14

SECTION X. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
841	− 808.78	− 534.92	− 808.83	− 535.08	−0.05	−0.16
842	794.56	350.42	794.00	350.81	+0.56	−0.39
843	792.60	713.78	792.01	713.98	+0.59	−0.20
844	774.69	345.72	774.54	346.12	+0.15	−0.40
845	761.80	659.51	762.17	660.52	−0.37	−1.01
846	− 759.17	− 516.63	− 759.29	− 517.59	−0.12	−0.96
847	726.72	666.62	726.68	667.63	+0.04	−1.01
848	718.80	710.49	720.69	711.11	−1.89	−0.62
849	711.24	636.95	711.04	637.31	+0.20	−0.36
850	684.50	542.57	684.80	542.45	−0.30	+0.12
851	− 684.26	− 509.61	− 684.07	− 510.12	+0.19	−0.51
852	681.80	417.86	681.56	418.22	+0.24	−0.36
853	647.90	311.50	647.49	311.80	+0.41	−0.30
854	629.65	533.37	629.31	534.19	+0.34	−0.82
855	603.53	650.04	603.98	650.94	−0.45	−0.90
856	− 560.91	− 668.44	− 560.79	− 668.46	+0.12	−0.02
857	542.49	567.87	542.65	567.72	−0.16	+0.15
21	535.99	305.22	536.10	304.97	−0.11	+0.25
848	532.37	404.52	532.07	404.98	+0.30	−0.46
859	524.46	717.37	524.35	718.50	+0.11	−1.13
860	− 520.47	− 358.47	− 518.14	− 359.78	+2.33	−1.31
861	496.36	290.32	496.09	290.53	+0.27	−0.21
862	492.95	725.28	492.69	725.47	+0.26	−0.19
863	485.25	370.12	485.09	370.03	+0.16	+0.09
864	484.48	633.19	483.81	633.89	+0.67	−0.70
865	− 441.92	− 527.18	− 442.40	− 527.86	−0.48	−0.68
866	441.28	520.64	441.36	521.71	−0.08	−1.07
867	425.29	732.39	426.15	733.95	−0.86	−1.56
868	414.83	500.04	414.12	499.70	+0.71	+0.34
869	377.52	722.29	377.47	722.37	+0.05	−0.08
870	− 359.78	− 379.19	− 359.98	− 378.95	−0.20	+0.24
871	359.09	325.52	358.69	325.23	+0.40	+0.29
872	317.44	622.24	317.07	622.96	+0.37	−0.72
873	315.69	529.43	314.20	530.86	+1.49	−1.43
874	312.73	346.42	311.92	346.30	+0.81	+0.12
875	+ 311.95	− 680.55	− 311.46	− 679.78	+0.49	+0.77
876	287.66	562.66	287.63	562.66	+0.03	0.00
877	276.21	659.75	276.28	659.87	−0.07	−0.12
878	271.65	423.45	271.10	424.05	+0.55	−0.60
879	266.71	671.64	266.66	671.75	+0.05	−0.11

TABLE 14

SECTION X. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
880	16.6	− 6.9958	−17.1011	− 6.9559	−17.1413
881	17.9	6.9837	10.9896	6.9819	11.0243
882	15.2	6.8705	15.7618	6.8469	15.7933
883	17.9	6.5418	12.5163	6.5874	12.5538
884	19.0	6.1920	10.2438		
885	19.0	− 6.1675	− 7.5841		
886	17.9	5.8425	11.3776	− 5.8086	−11.4008
887	19.0	5.7070	13.0000	5.7214	12.9936
888	19.0	5.3610	12.7648	5.3329	12.7848
889	13.3	4.9002	7.3733		
890	13.4	− 4.6805	−17.2481	− 4.6549	−17.2526
891	16.8	4.4720	14.1158	4.4512	14.1303
892	16.8	4.2465	13.7996	4.2219	13.8246
893	13.4	4.1947	17.0026	4.1496	17.0170
894	15.2	3.8900	9.0616	3.8682	9.0870
895	19.0	− 3.8782	− 6.9206		
896	13.4	3.3722	10.7871	− 3.3449	−10.8073
897	19.0	3.3552	7.0471		
898	14.4	2.8708	15.8421	2.8436	15.8518
899	14.1	2.4442	15.2296	2.4062	15.2440
900	17.9	− 2.3648	− 9.3914	− 2.3964	− 9.4136
901	15.5	2.1962	14.6231	2.1684	14.6382
902	15.2	1.5292	7.5772	1.5116	7.5860
757	11.7	1.4468	6.9186	1.3918*	6.9208*
903	17.9	1.4318	15.5071	1.3716	15.5676
904	16.8	− 1.0075	−16.7098	− 0.9712	−16.7408
905	16.2	− 0.6175	9.8886	− 0.6096	9.9128
906	14.5	− 0.4590	19.4706	− 0.4126	19.5043
907	16.2	− 0.0777	10.7338	− 0.0552	10.7588
908	15.5	+ 0.0992	11.2408	+ 0.1236	11.2553
909	15.5	+ 0.6900	−10.5898	+ 0.7023	−10.6018
910	17.9	0.6905	15.3638	0.7451	15.4053
911	16.8	0.9880	7.7634	0.9966	7.7836
912	14.7	1.2152	8.6036	1.2381	8.6198
913	17.7	1.4325	9.4684	1.4523	9.4953
914	17.3	+ 1.8672	−14.1494	+ 1.8893	−14.1550
915	16.1	2.1108	11.8518	2.1363	11.8620
916	14.3	2.3410	9.2796	2.3681	9.2856
917	15.5	4.3902	11.4568	4.4053	11.4753
918	15.5	4.6052	11.3226	4.6368	11.3380

*Measured and reduced with Section XIII.

TABLE 14

SECTION X. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V—III	V—III
	″	″	″	″	″	″
880	− 264.46	− 648.93	− 264.08	− 649.71	+0.38	−0.78
881	264.13	417.22	265.00	417.75	−0.87	−0.53
882	259.73	598.14	259.93	598.59	−0.20	−0.45
883	247.33	475.07	250.05	475.73	−2.72	−0.66
884	234.11	388.88				
885	− 233.23	− 288.04				
886	220.83	431.85	− 220.50	− 431.97	+0.33	−0.12
887	215.65	493.35	217.21	492.37	−1.56	+0.98
888	202.53	484.41	202.47	484.44	+0.06	−0.03
889	185.16	279.96				
890	− 176.62	− 654.34	− 176.81	− 653.84	−0.19	+0.50
891	168.78	535.57	169.05	535.42	−0.27	+0.15
892	160.23	523.56	160.34	523.82	−0.11	−0.26
893	158.20	645.00	157.64	644.88	+0.56	+0.12
894	146.80	343.90	146.88	344.15	−0.08	−0.25
895	− 146.40	− 262.73				
896	127.13	409.29	− 127.05	− 409.36	+0.08	−0.07
897	126.56	267.49				
898	108.00	600.91	108.09	600.64	−0.09	+0.27
899	91.83	577.65	91.49	577.57	+0.34	+0.08
900	− 88.94	− 356.30	− 91.06	− 356.47	−2.12	−0.17
901	82.43	554.64	82.47	554.59	−0.04	+0.05
902	57.28	287.46	57.48	287.13	−0.20	+0.33
757	54.16	262.48	53.15	262.12	+1.01	+0.36
903	53 42	588.10	52.26	589.80	+1.16	−1.70
904	− 37.30	− 633.67	− 37.08	− 634.27	+0.22	−0.60
905	22.64	375.03	23.29	375.33	−0.65	−0.30
906	16.43	738.31	15.93	739.05	+0.50	−0.74
907	− 2.15	407.04	− 2.27	407.39	−0.12	−0.35
908	+ 4.57	426.25	+ 4.50	426.21	−0.07	+0.04
909	+ 26.97	− 401.52	+ 26.46	− 401.40	−0.51	+0.12
910	27.09	582.52	28.03	583.56	+0.94	−1.04
911	38.22	294.34	37.65	294.52	−0.57	−0.18
912	46.86	326.18	46.80	326.22	−0.06	−0.04
913	55.12	358.95	54.92	359.41	−0.20	−0.46
914	+ 71.71	− 536.40	+ 71.44	− 536.10	−0.27	+0.30
915	80.90	449.27	80.83	449.13	−0.07	+0.14
916	89.58	351.73	89.65	351.42	+0.07	+0.31
917	167.36	434.14	166.90	434.37	−0.46	−0.23
918	175.52	429.03	175.68	429.15	+0.16	−0.12

TABLE 14

SECTION X. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
919	17.3	+ 5.0082	− 9.7846	+ 5.0471	− 9.8133
920	15.2	5.7742	10.2418	5.8038	10.2523
921	14.7	6.0875	11.4731	6.1076	11.4736
922	17.9	6.1535	9.6486	6.1786	9.7060
923	16.2	6.7838	13.0521	6.8108	13.0536
924	16.1	+ 7.2865	− 9.2481	+ 7.3266	− 9.2558
925	17.9	7.3135	12.5776	7.3413	12.6216
926	16.5	7.3880	18.7391	7.4336	18.7555
927	14.4	7.5390	17.3043	7.5796	17.3048
928	14.0	7.7685	11.9731	7.7966	11.9730
929	13.3	+ 8.2492	−17.6453	+ 8.2898	−17.6570
930	14.2	8.3977	9.1768	8.4176	9.1845
931	16.2	8.4148	11.0746	8.4381	11.1085
932	16.8	8.5088	12.0973	8.5138	12.1050
933	13.3	8.9050	11.1371	8.9248	11.1416
934	16.8	+ 8.9548	−13.7334	+ 8.9811	−13.7326
935	13.1	9.3458	13.0238	9.3808	13.0268
936	15.1	10.1830	11.2711	10.2081	11.2805
937	12.8	10.1918	7.9256	10.2172	7.9243
938	12.8	10.6818	12.4421	10.7206	12.4383
939	13.4	+11.3277	− 7.1441		
940	13.3	11.6035	10.0774	+11.6428	−10.0919
941	16.1	11.9545	15.8496	11.9938	15.8693
942	16.5	11.9692	10.8216	11.9993	10.8390
943	16.4	12.3495	11.6734	12.3741	11.6688
944	17.9	12.6555	11.3944	12.6653	11.4083

SECTION XI. MEASURED COORDINATES

945	15.7	−28.2155	−35.5726	−28.2193	−35.5687
946	10.7	27.9947	21.3729	27.9876	21.3527
947	13.3	27.8662	32.6719	27.8811	32.6620
948	16.8	27.7322	34.5552	27.7276	34.5402
949	13.7	27.7035	36.1874	27.7001	36.1784
950	14.7	−27.5315	−20.4842	−27.5361	−20.4694
951	13.7	27.2760	33.2814	27.2678	33.2707
952	14.7	27.2422	44.1784	27.2313	44.1760
953	17.0	27.0560	33.7246	27.0263	33.7127
954	15.7	26.9395	42.6156	26.9409	42.6154

TABLE 14

SECTION X. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y		
	″	″	″	″	″	″
919	+ 190.77	− 370.69	+ 191.26	− 371.32	+0.49	−0.63
920	219.84	387.97	219.95	387.93	+0.11	+0.04
921	231.75	434.64	231.46	434.23	−0.29	+0.41
922	234.22	365.46	234.18	367.20	−0.04	−1.74
923	258.20	494.45	258.12	494.12	−0.08	+0.33
924	+ 277.19	− 350.19	+ 277.72	− 350.08	+0.53	+0.11
925	278.28	476.43	278.24	477.72	−0.04	−1.29
926	281.24	710.03	281.67	710.32	+0.43	−0.29
927	286.94	655.62	287.23	655.30	+0.29	+0.32
928	295.53	453.48	295.52	453.10	−0.01	+0.38
929	+ 313.89	− 668.50	+ 314.16	− 668.63	+0.27	−0.13
930	319.34	347.41	319.10	347.33	−0.24	+0.08
931	320.03	419.36	319.86	420.29	−0.17	−0.93
932	323.62	458.13	322.72	458.08	−0.90	+0.05
933	338.63	421.70	338.32	421.53	−0.31	+0.17
934	+ 340.57	− 520.13	+ 340.42	− 519.78	−0.15	+0.35
935	355.39	493.20	355.59	493.00	+0.20	+0.20
936	387.11	426.69	386.99	426.74	−0.12	−0.05
937	387.38	299.85	387.37	299.47	−0.01	+0.38
938	406.06	471.05	406.42	470.62	+0.36	+0.43
939	+ 430.45	− 270.14				
940	440.98	381.33	+ 441.42	− 381.61	+0.44	−0.28
941	454.41	600.16	454.67	600.68	+0.26	−0.52
942	454.87	409.52	454.93	409.92	+0.06	−0.40
943	469.31	441.79	469.14	441.37	−0.17	+0.42
944	+ 480.91	− 431.19	+ 480.19	− 431.48	−0.72	−0.29

SECTION XI. REDUCED COORDINATES

945	−1070.68	−1349.27	−1070.85	−1349.58	−0.17	−0.31
946	1062.16	810.80	1061.95	810.49	+0.21	+0.31
947	1057.39	1239.26	1058.00	1239.34	−0.61	−0.08
948	1052.33	1310.67	1052.18	1310.56	+0.15	+0.11
949	1051.26	1372.57	1051.15	1372.68	+0.11	−0.11
950	−1044.57	− 777.08	−1044.82	− 776.97	−0.25	+0.11
951	1035.01	1262.35	1034.73	1262.40	+0.28	−0.05
952	1033.83	1675.58	1033.43	1675.94	+0.40	−0.36
953	1026.66	1279.15	1025.57	1279.15	+1.09	0.00
954	1022.33	1616.31	1022.40	1616.75	−0.07	−0.44

TABLE 14

SECTION XI. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
955	15.2	−26.8927	−22.4446	−26.8821	−22.4320
956	14.9	26.5120	26.4474	26.5166	26.4397
957	15.5	26.3452	35.0204	26.3333	35.0094
958	16.8	26.2865	43.5506	26.2843	43.5482
959	14.4	25.6605	24.8926	25.6596	24.8864
960	13.1	−25.5730	−22.6822	−25.5616	−22.6532
961	15.0	24.4750	40.1216	24.4593	40.1180
962	17.6	24.4290	37.9264	24.3866	37.9150
963	15.4	24.3537	40.6039	24.3533	40.5914
964	15.7	24.3382	30.0216	24.3368	30.0247
965	16.6	24.3255	−33.3422	−24.3053	−33.3847
966	17.6	24.2432	37.5054	24.2433	37.4747
967	13.5	23.9975	23.8779	23.9781	23.8630
968	13.3	23.8280	41.1529	23.8268	41.1440
969	16.6	23.6237	33.5004	23.6133	33.4960
970	13.1	−23.3882	−42.7716	−23.3743	−42.7602
971	13.4	22.7780	44.8936	22.7568	44.8764
972	16.0	22.7368	22.6472	22.7366	22.6160
973	16.8	22.6800	25.5669	22.6848	25.5744
974	15.3	22.2410	24.7516	22.2291	24.7384
975	14.3	−22.1038	−35.6209	−22.1039	−35.6032
976	15.2	21.9780	20.7364	21.9886	20.7312
977	16.2	21.9475	20.2202	21.9283	20.2202
978	15.9	21.6652	31.2574	21.6551	31.2434
979	15.9	21.6195	43.1784	21.6109	43.1714
980	13.3	−21.5425	−28.7552	−21.5279	−28.7362
981	15 1	21.4935	20.9472	21.4873	20.9390
982	14.0	21.4135	30.2686	21.3956	30.2532
983	15.4	21.3070	42.2749	21.3201	42.2574
984	15.2	21.0425	26.7046	21.0351	26.6928
985	15.2	−21.0020	−41.8526	−21.0053	−41.8517
986	14.4	20.9040	21.4039	20.8956	21.3977
987	17.3	20.1688	27.5504	20.1703	27.5377
988	14.9	19.9967	35.9612	19.9983	35.9374
989	16.8	19.9278	27.4614	19.9251	27.4517
990	14.1	−19.8715	−23.1006	−19.8641	−23.0942
991	14.4	19.6218	44.7046	19.6126	44.7004
992	15.5	19.1035	32.8582	19.0911	32.8464
993	16.5	19.0972	36.8652	19.0843	36.8392
994	15.0	18.4528	21.3394	18.4551	21.3472

TABLE 14

SECTION XI. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V—III	V—III
	″	″	″	″	″	″
955	−1020.35	− 851.40	−1020.02	− 851.37	+0.33	+0.03
956	1005.95	1003.18	1006.18	1003.33	−0.23	−0.15
957	999.71	1328.27	999.29	1328.30	+0.42	−0.03
958	997.56	1651.74	997.50	1652.10	+0.06	−0.36
959	973.63	944.19	973.66	944.40	−0.03	−0.21
960	− 970.28	− 860.37	− 969.92	− 859.71	+0.36	+0.66
961	928.80	1521.65	928.24	1521.95	+0.56	−0.30
962	927.03	1438.40	925.46	1438.41	+1.57	−0.01
963	924.20	1539.93	924.22	1539.90	−0.02	+0.03
964	923.50	1138.64	923.51	1139.20	−0.01	−0.56
965	− 923.06	−1264.56	− 922.34	−1266.61	+0.72	−2.05
966	919.97	1422.43	920.02	1421.71	−0.05	+0.72
967	910.52	905.66	909.86	905.53	+0.66	+0.13
968	904.26	1560.74	904.25	1560.83	+0.01	−0.09
969	896.43	1270.54	896.09	1270.81	+0.34	−0.27
970	− 887.59	−1622.10	− 887.09	−1622.11	+0.50	−0.01
971	864.45	1702.55	863.68	1702.33	+0.77	+0.22
972	862.67	858.94	862.75	858.19	−0.08	+0.75
973	860.54	969.66	860.81	970.38	−0.27	−0.72
974	843.88	938.73	843.51	938.66	+0.37	+0.07
975	− 838.78	−1350.90	− 838.84	−1350.66	−0.06	+0.24
976	833.86	786.46	834.36	786.69	−0.50	−0.23
977	832.70	766.88	832.07	767.31	+0.63	−0.43
978	822.10	1185.42	821.78	1185.31	+0.32	+0.11
979	820.48	1637.47	820.20	1637.63	+0.28	−0.16
980	− 817.41	−1090.53	− 816.94	−1090.23	+0.47	+0.30
981	815.48	794.44	815.34	794.55	+0.14	−0.11
982	812.54	1147.91	811.93	1147.75	+0.61	+0.16
983	808.61	1603.20	809.16	1602.96	−0.55	+0.24
984	798.42	1012.75	798.23	1012.72	+0.19	+0.03
985	− 797.04	−1587.18	− 797.21	−1587.56	−0.17	−0.38
986	793.11	811.74	792.90	811.92	+0.21	−0.18
987	765.28	1044.79	765.43	1044.73	−0.15	+0.06
988	758.83	1363.73	758.96	1363.25	−0.13	+0.48
989	756.14	1041.41	756.12	1041.46	+0.02	−0.05
990	− 753.96	− 876.04	− 753.78	− 876.22	+0.18	−0.18
991	744.70	1695.28	744.40	1695.54	+0.30	−0.26
992	724.91	1246.04	724.52	1246.00	+0.39	+0.04
993	724.71	1397.99	724.29	1397.41	+0.42	+0.58
994	700.11	809.21	700.31	809.92	−0.20	−0.71

TABLE 14

SECTION XI. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
995	17.9	−18.2115	−22.2199	−18.1818	−22.2302
996	15.7	18.1978	30.3372	18.2566	30.2974
997	15.5	18.1970	32.7632	18.1989	32.7647
998	16.8	18.1680	30.6462	18.1728	30.6410
999	14.2	18.0662	36.3152	18.0676	36.3104
1000	17.1	−17.9323	−26.2462	−17.9413	−26.2504
1001	14.3	17.9000	40.5759	17.8933	40.5680
1002	15.1	17.8958	35.9499	17.8908	35.9344
1003	15.1	17.2365	35.4436	17.2321	35.4417
1004	15.7	16.7835	37.3259	16.7679	37.3282
1005	17.1	−16.7318	−25.1574	−16.7216	−25.1470
1006	15.5	16.6892	48.1829	16.6803	48.1887
1007	16.8	16.0572	47.0452	16.0549	47.0460
1008	16.5	15.5305	29.8146	15.5231	29.8060
1009	17.9			15.4749	46.2910
1010	14.7	−15.4250	−30.4989	−15.4219	−30.4834
1011	16.4	15.3500	27.8146	15.3503	27.7890
1012	14.7	14.7502	23.4874	14.7441	23.4737
1013	15.2	14.6618	39.1572	14.6701	39.1430
1014	16.8	14.4468	43.5279	14.4491	43.5197
1015	15.5	−14.1742	−26.2419	−14.1831	−26.2292
1016	13.5	14.0612	38.8389	14.0646	38.8274
1017	15.2	13.8688	39.0382	13.8756	39.0342
1018	15.0	13.8565	35.8807	13.8541	35.8687
1019	16.8	13.5398	20.1449	13.5216	20.1552
1020	16.8	−13.3110	−28.7009	−13.3346	−28.7007
1021	16.3	12.7430	34.5924	12.7356	34.5897
1022	16.8	12.5768	45.7246	12.5609	45.6870
1023	13.4	12.5298	41.0526	12.5193	41.0414
1024	15.1	12.2000	20.4802	12.1873	20.4802
1025	17.3	−11.7790	−32.4954	−11.7373	−32.4894
1026	16.2	11.6782	21.3284	11.6781	21.3230
1027	13.7	11.3900	22.8596	11.3576	22.8550
1028	14.7	11.2970	20.6164	11.2939	20.6170
1029	14.2	11.2372	24.6474	11.2318	24.6342
1030	15.2	−11.2345	−36.4166	−11.2476	−36.3950
1031	14.4	11.0645	25.4124	11.0603	25.4087
1032	14.1	10.4515	43.0856	10.4481	43.0816
1033	16.2	10.3590	31.3762	10.3546	31.3732
1034	14.7	10.3202	32.3742	10.3091	32.3697

TABLE 14

SECTION XI. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
995	− 690.96	− 842.59	− 689.95	− 843.39	+1.01	−0.80
996	690.52	1150.41	692.84	1149.31	−2.32	+1.10
997	690.52	1242.40	690.67	1242.87	−0.15	−0.47
998	689.39	1162.12	689.67	1162.34	−0.28	−0.22
999	685.59	1377.09	685.72	1377.32	−0.13	−0.23
1000	− 680.41	− 995.26	− 680.85	− 995.83	−0.44	−0.57
1001	679.32	1538.66	679.14	1538.77	+0.18	−0.11
1002	679.12	1363.24	679.01	1363.06	+0.11	+0.18
1003	654.10	1344.02	654.02	1344.35	+0.08	−0.33
1004	636.93	1415.38	636.42	1415.87	+0.51	−0.49
1005	− 634.85	− 953.94	− 634.57	− 953.94	+0.28	0.00
1006	633.46	1827.08	633.18	1827.71	+0.28	−0.63
1007	609.47	1783.92	609.44	1784.35	+0.03	−0.43
1008	589.31	1130.50	589.14	1130.57	+0.17	−0.07
1009			587.43	1755.70		
1010	− 585.32	−1156.45	− 585.30	−1156.26	+0.02	+0.19
1011	582.44	1054.65	582.57	1054.08	−0.13	+0.57
1012	559.64	890.54	559.54	890.42	+0.10	+0.12
1013	556.44	1484.75	556.85	1484.61	−0.41	+0.14
1014	548.33	1650.49	548.49	1650.57	−0.16	−0.08
1015	537.81	− 994.98	− 538.27	− 994.88	−0.46	+0.10
1016	533.65	1472.66	533.87	1472.62	−0.22	+0.04
1017	526.35	1480.22	526.70	1480.45	−0.35	−0.23
1018	525.86	1360.48	525.86	1360.41	0.00	+0.07
1019	513.68	763.75	513.13	764.53	+0.55	−0.78
1020	− 505.09	−1088.20	− 506.19	−1088.57	−1.01	−0.37
1021	483.59	1311.59	483.42	1311.87	+0.17	−0.28
1022	477.40	1733.73	476.88	1732.68	+0.52	+1.05
1023	475.57	1556.56	475.26	1556.52	+0.31	+0.04
1024	462.85	776.42	462.51	776.80	+0.34	−0.38
1025	− 447.00	−1232.04	− 445.53	−1232.19	+1.47	−0.15
1026	443.06	808.57	443.20	808.74	−0.14	−0.17
1027	432.14	866.62	431.05	866.83	+1.09	−0.21
1028	428.59	781.56	428.62	781.96	−0.03	−0.40
1029	426.36	934.41	426.30	934.29	+0.06	+0.12
1030	− 426.37	−1380.71	− 426.98	−1380.27	−0.61	+0.44
1031	419.81	963.42	419.80	963.65	+0.01	−0.23
1032	396.73	1633.58	396.70	1633.80	+0.03	−0.22
1033	393.11	1189.55	393.07	1189.81	+0.04	−0.26
1034	391.64	1227.39	391.35	1227.59	+0.29	−0.20

TABLE 14

SECTION XI. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
1035	14.0	−10.0478	−24.8059	−10.0460	−24.7944
1036	13.5	9.8995	40.5726	9.8911	40.5622
1037	16.8	9.8590	28.0474	9.8583	28.0627
1038	16.8	9.7252	32.7819	9.7356	32.8044
1039	15.2	9.6810	41.1506	9.6751	41.1482
1040	15.0	− 9.5960	−22.0399	− 9.5946	−22.0354
1041	15.7	9.5078	33.4424	9.4713	33.4317
1042	13.5	9.3613	39.3142	9.3276	39.3032
1043	17.3	9.1820	38.1539	9.1773	38.1172
1044	17.9	9.1810	43.0012	9.1591	43.0270
1045	14.1	− 9.1022	−35.1936	− 9.0769	−35.1840
1046	14.7	8.5510	30.4339	8.5498	30.4360
1047	16.2	8.3690	38.4006	8.3615	38.3924
1048	17.3	8.2725	40.8644	8.2868	40.8884
1049	16.8	8.2255	40.1654	8.1953	40.1514
1050	16.8	− 7.5912	−26.1789	− 7.5676	−26.1790
1051	14.7	7.5680	38.4594	7.5768	38.4460
1052	15.5	7.4692	20.7542	7.4626	20.7412
1053	14.5	7.4422	36.1499	7.4416	36.1430
1054	14.5	7.4218	20.4244	7.4111	20.4142
1055	16.2	− 7.1760	−39.9266	− 7.1726	−39.9154
1056	17.3	6.9048	28.2289	6.9156	28.2500
1057	14.3	6.7885	32.6642	6.7751	32.6576
1058	16.8	6.7175	42.4279	6.7343	42.4097
1059	17.3	6.6562	27.6889	6.6211	27.7220
1060	14.4	− 6.5225	−23.1189	− 6.5121	−23.1120
1061	16.6	6.3598	35.0582	6.3629	35.0697
1062	13.4	6.3410	34.5552	6.3263	34.5587
1063	16.6	6.3290	35.5142	6.3051	35.5200
1064	16.8	6.1862	27.2596	6.1776	27.2692
1065	15.4	− 5.8402	−33.3284	− 5.8416	−33.3150
1066	15.2	5.5148	22.7089	5.5101	22.7197
1067	15.4	5.4360	31.2149	5.4421	31.2004
1068	14.4	5.4025	24.5934	5.3968	24.5817

TABLE 14

SECTION XI. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_Y	V_X
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
1035	− 381.23	− 940.39	− 381.31	− 940.32	−0.08	+0.07
1036	375.76	1538.27	375.55	1538.24	+0.21	+0.03
1037	374.10	1063.30	374.21	1064.25	−0.11	−0.95
1038	369.07	1242.83	369.59	1244.05	−0.52	−1.22
1039	367.48	1560.18	367.36	1560.46	+0.12	−0.28
1040	− 364.06	− 835.48	− 364.16	− 835.68	−0.10	−0.20
1041	360.83	1267.87	359.57	1267.83	+1.26	+0.04
1042	355.33	1490.53	354.16	1490.48	+1.17	+0.05
1043	348.51	1446.53	348.45	1445.50	+0.06	+1.03
1044	348.52	1630.34	347.80	1631.68	+0.72	−1.34
1045	345.46	−1334.27	− 344.62	−1334.27	+0.84	0.00
1046	324.49	1153.76	324.59	1154.20	−0.10	−0.44
1047	317.67	1455.86	317.51	1455.91	+0.16	−0.05
1048	314.03	1549.28	314.69	1550.55	−0.66	−1.27
1049	312.24	1522.77	311.21	1522.60	+1.03	+0.17
1050	− 288.03	− 992.37	− 287.30	− 992.73	+0.73	−0.36
1051	287.28	1458.06	287.74	1457.91	−0.46	+0.15
1052	283.35	786.66	283.27	786.52	+0.08	+0.14
1053	282.48	1370.48	282.59	1370.57	−0.11	−0.09
1054	281.55	774.15	281.31	774.12	+0.24	+0.03
1055	− 272.42	−1513.68	−272.41	−1513.61	+0.01	+0.07
1056	262.01	1070.09	262.58	1071.24	−0.57	−1.15
1057	257.64	1238.27	257.28	1238.38	+0.36	−0.11
1058	255.05	1608.52	255.80	1608.18	−0.75	+0.34
1059	252.57	1049.60	251.40	1051.21	+1.17	−1.61
1060	− 247.45	− 876.30	− 247.23	−876.68	+0.32	−0.38
1061	241.40	1329.04	241.66	1329.83	−0.26	−0.79
1062	240.68	1309.97	240.27	1310.45	+0.41	−0.48
1063	240.24	1346.33	239.47	1346.90	+0.77	−0.57
1064	234.74	1033.61	234.57	1034.02	+0.17	−0.41
1065	− 221.67	−1263.43	− 221.87	−1263.27	−0.20	+0.16
1066	209.22	860.72	209.23	861.47	−0.01	−0.27
1067	206.31	1183.27	206.70	1183.07	−0.39	+0.20
1068	204.97	932.17	204.93	932.08	+0.04	+0.09

TABLE 14
SECTION XII. MEASURED COORDINATES

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
1069	11.9	−46.8494	−50.1576		
1070	17.3	46.7698	50.6938	−46.7348	−50.7600
1071	17.0	46.6696	54.6721		
1072	17.9	46.2776	59.0854		
7	10.2	46.2531	56.3848	46.1855	56.4540
1073	17.0	− 46.1586	−52.0011	−46.1101	−52.0428
1074	15.0	45.7348	54.9936	45.6776	55.0715
1075	19.0	45.7001	48.5468		
1076	15.4	45.6884	53.5316	45.6326	53.5852
1077	16.8	44.9826	56.8526	44.9321	56.8990
1078	19.0	−44.6874	−60.1291	−44.5914	−60.2008
1079	17.9	44.3044	57.1014		
1080	19.0	44.2536	56.0223	44.1474	56.0468
1081	13.9	44.1801	58.9798	44.0966	59.0515
1082	15.7	43.8856	57.0596	43.8261	57.1330
1083	13.7	−43.3056	−56.8881	−43.2324	−56.9425
1084	15.7	43.2728	51.9866	43.2228	52.0555
1085	16.8	43.1931	52.7984	43.1278	52.8572
1086	16.8	43.0926	49.4621	43.0341	49.5022
1087	13.4	42.8384	60.7281	42.7611	60.7883
1088	11.9	−42.6886	−59.0748	−42.6411	−59.1375
1089	17.9	42.5716	58.7696	42.5566	58.7950
1090	10.8	41.1028	54.6131	41.0314	54.6745
1091	16.8	40.6716	59.2998	40.5808	59.3348
1092	15.0	40.6058	49.9513	40.5688	49.9982
1093	15.7	−40.4211	−51.6368	−40.3618	−51.6755
1094	15.7	39.7386	50.8818	39.6964	50.9119
1095	17.2	39.5846	59.0894	39.5085	59.1490
1096	17.9	39.2196	51.3146	39.1394	51.3408
1097	16.2	38.7928	51.5994	38.7301	51.6352
1098	14.4	−38.4531	−49.3316	−38.4004	−49.3700
1099	19.0	38.1348	54.3156	38.0868	54.3555
1100	16.2	37.9958	53.3593	37.9141	53.4092
1101	19.0	37.7108	53.9826		
1102	14.2	37.1144	51.6288	37.0494	51.6742
1103	17.9	−37.0578	−58.2423	−36.9841	−58.2798
1104	14.2	36.4054	53.5654	36.3536	53.5960
1105	16.8	36.3184	59.2018	36.2634	59.2623
1106	16.2	36.0956	55.4466	36.0291	55.4888
1107	16.8	36.0796	56.3256	36.0188	56.3345

TABLE 14
SECTION XII. REDUCED COORDINATES

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
1069	−1775.67	−1905.15				
1070	1772.63	1925.47	−1773.31	−1925.98	−0.68	−0.51
1071	1768.75	2076.30				
1072	1753.79	2243.59				
7	1752.91	2141.20	1752.54	2141.84	+0.37	−0.64
1073	−1749.42	−1974.99	−1749.63	−1974.59	−0.21	+0.40
1074	1733.28	2088.42	1733.26	2089.41	+0.02	−0.99
1075	1732.10	1843.99				
1076	1731.55	2032.99	1731.54	2033.05	+0.01	−0.06
1077	1704.71	2158.84	1705.00	2158.66	−0.29	+0.18
1078	−1693.44	−2283.05	−1692.12	−2283.84	+1.32	−0.79
1079	1678.98	2168.23				
1080	1677.08	2127.31	1675.23	2126.32	+1.85	+0.99
1081	1674.22	2239.43	1673.34	2240.24	+0.88	−0.81
1082	1663.09	2166.61	1663.06	2167.49	+0.03	−0.88
1083	−1641.10	−2160.07	−1640.54	−2160.24	+0.56	−0.17
1084	1639.96	1974.23	1640.12	1974.96	−0.16	−0.73
1085	1636.92	2005.00	1636.52	2005.35	+0.40	−0.35
1086	1633.17	1878.50	1632.93	1878.14	+0.24	+0.36
1087	1623.29	2305.62	1622.70	2306.04	+0.59	−0.48
1088	−1617.65	−2242.91	−1618.13	−2243.44	−0.48	−0.53
1089	1613.21	2231.35	1614.92	2030.45	−1.71	+0.90
1090	1557.59	2073.65	1557.03	2074.17	+0.56	−0.52
1091	1541.13	2251.31	1539.99	2250.84	+1.14	+0.47
1092	1538.83	1896.87	1539.43	1896.85	−0.60	+0.02
1093	−1531.79	−1960.76	−1531.59	−1960.43	+0.20	+0.33
1094	1505.92	1932.08	1506.35	1931.46	−0.43	+0.62
1095	1499.90	2243.25	1499.31	2243.75	+0.59	−0.50
1096	1486.22	1948.45	1485.23	1947.69	+0.99	+0.76
1097	1470.02	1959.22	1469.70	1958.84	+0.32	+0.38
1098	−1457.19	−1873.21	−1457.17	−1872.94	+0.02	+0.27
1099	1445.01	2062.15	1445.34	2061.95	−0.33	+0.20
1100	1439.76	2025.88	1438.77	2026.07	+0.99	−0.19
1101	1428.93	2049.49				
1102	1406.36	1960.21	1405.96	1960.25	+0.40	−0.04
1103	−1404.07	−2210.94	−1403.55	−2210.69	+0.52	+0.25
1104	1379.42	2033.58	1379.59	2033.09	−0.17	+0.49
1105	1376.00	2247.27	1376.23	2247.91	−0.23	−0.64
1106	1367.63	2104.88	1367.30	2104.84	+0.33	+0.04
1107	1367.01	2138.20	1366.92	2136.90	+0.09	+1.30

TABLE 14

SECTION XII. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
1108	13.4	−35.7611	−50.8194	−35.6948	−50.8535
1109	16.2	35.4358	57.4461	35.3788	57.5012
1110	16.8	34.0788	57.1591	34.0136	57.1872
1111	16.8	33.9901	52.2551		
1112	17.9	33.5866	58.1418	33.5224	58.1902
1113	15.9	−32.5796	−50.8308	−32.5176	−50.8768
1114	14.7	30.8258	56.6921	30.7701	56.7425
1115	14.5	30.5471	56.6024	30.4896	56.6352
1116	11.7	30.0127	51.9128	29.9461	51.9448
1117	14.2	29.9818	53.3941	29.9251	53.4320
1118	15.2	−29.8631	−54.7006	−29.7881	−54.7498
1119	15.5	29.8578	53.7031	29.7906	53.7588
1120	16.8	29.7573	58.6823	29.6966	58.7120
1121	16.5	29.5948	60.3376	29.5561	60.3742
1122	16.8	29.3374	60.1066	29.2964	60.1642
1123	11.2	−28.5724	−53.6321	−28.5241	−53.6692
1124	15.0	28.3758	59.0414	28.3101	59.0960
1125	14.2	27.5551	54.3146	27.4828	54.3592
1126	14.2	27.2451	54.8368	27.1976	54.8640
1127	14.7	26.4126	49.8766	26.3664	49.9082
1128	16.6	−26.3881	−52.7611	−26.3176	−52.8130
1129	13.7	26.0961	59.9948	26.0304	60.0257
19	11.2	25.6714	53.0151	25.6054	53.0380
1130	16.8	25.6238	59.8768	25.5556	59.9170
1131	15.2	25.4398	56.9696	25.3806	57.0142
1132	14.0	−24.9356	−58.1101	−24.8626	−58.1532
1133	17.9	24.8594	53.7651	24.7926	53.7962
1134	16.8	24.7804	55.9014	24.7076	55.9498
1135	14.0	24.6286	57.4686	24.5611	57.5002
1136	16.8	24.4508	54.1941	24.3876	54.2185
1137	17.9	−23.4481	−56.8628	−23.3938	−56.9562
1138	17.9	23.0658	57.2368	22.9951	57.2752
1139	17.9	22.8806	56.7511	22.8238	56.8038
1140	15.7	21.1294	49.1166	21.0628	49.1585
1141	16.8	21.0468	55.2294	21.0003	55.2898
1142	15.5	−21.0351	−50.0968	−20.9678	−50.1327
1143	16.6	20.7498	49.9146	20.7064	49.9542
1144	17.3	20.5136	51.8218	20.4378	51.8385
1145	13.7	20.4838	58.3996	20.4131	58.4395
1146	15.5	20.3308	55.7958	20.2666	55.8235

TABLE 14

SECTION XII. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
1108	−1355.04	−1929.42	−1354.57	−1929.08	+0.47	+0.34
1109	1342.56	2180.64	1342.66	2181.11	−0.10	−0.47
1110	1291.09	2169.66	1290.87	2169.15	+0.22	+0.51
1111	1287.83	1983.72				
1112	1272.40	2206.88	1272.25	2207.16	+0.15	−0.28
1113	−1234.36	−1929.62	−1234.06	−1929.83	+0.30	−0.21
1114	1167.71	2151.71	1167.84	2152.16	−0.13	−0.45
1115	1157.14	2148.29	1157.20	2148.08	−0.06	+0.21
1116	1136.96	1970.45	1136.53	1970.22	+0.43	+0.23
1117	1135.76	2026.61	1135.75	2026.61	+0.01	0.00
1118	−1131.23	−2076.13	−1130.57	−2076.56	+0.66	−0.43
1119	1131.05	2038.31	1130.66	2038.99	+0.39	−0.68
1120	1127.13	2227.09	1127.15	2226.78	−0.02	+0.31
1121	1120.93	2289.83	1121.84	2289.80	−0.91	+0.03
1122	1111.17	2281.05	1111.98	2281.83	−0.81	−0.78
1123	−1082.29	−2035.53	−1082.62	−2035.54	−0.33	−0.01
1124	1074.72	2240.60	1074.56	2241.29	+0.16	−0.69
1125	1043.69	2061.33	1043.13	2061.66	+0.56	−0.33
1126	1031.92	2081.10	1032.32	2080.79	−0.40	+0.31
1127	1000.44	1892.98	1000.74	1892.86	−0.30	+0.12
1128	− 999.45	−2002.34	− 998.92	−2002.99	+0.53	−0.65
1129	988.22	2276.58	988.10	2276.44	+0.12	+0.14
19	972.26	2011.92	971.90	2011.49	+0.36	+0.43
1130	970.31	2272.07	970.09	2272.30	+0.22	−0.23
1131	963.39	2161.83	963.42	2162.24	−0.03	−0.41
1132	− 944.24	−2205.03	− 943.79	−2205.40	+0.45	−0.37
1133	941.44	2040.29	941.08	2040.21	+0.36	+0.08
1134	938.40	2121.28	937.88	2121.85	+0.52	−0.57
1135	932.61	2180.69	932.34	2180.63	+0.27	+0.06
1136	925.94	2056.53	925.73	2056.20	+0.21	+0.33
1137	− 887.84	−2157.63	− 888.06	−2159.96	−0.22	−2.33
1138	873.33	2171.78	872.94	2172.04	+0.39	−0.26
1139	866.32	2153.36	866.44	2154.16	−0.12	−0.80
1140	800.05	1863.77	799.56	1864.22	+0.49	−0.45
1141	796.79	2095.53	797.26	2096.68	−0.47	−1.15
1142	− 796.46	−1900.93	− 795.97	−1901.15	+0.49	−0.22
1143	785.64	1894.00	786.05	1894.37	−0.41	−0.37
1144	776.64	1966.29	775.99	1965.81	+0.65	+0.48
1145	775.37	2215.68	775.02	2216.08	+0.35	−0.40
1146	769.62	2116.95	769.54	2116.89	+0.08	+0.06

TABLE 14

SECTION XII. MEASURED COORDINATES—CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
1147	16.8	−19.9616	−57.1151	−19.9388	−57.1672
1148	16.8	19.7831	56.4711	19.7478	56.5477
1149	16.8	19.6078	56.2091	19.5878	56.2240
1150	15.3	19.5574	49.4398	19.5076	49.4710
1151	16.8	19.3174	56.2681	19.2868	56.3072
1152	14.7	−19.2854	−51.8211	−19.2404	−51.8620
1153	17.9	18.9268	59.1444	18.8848	59.1580
1154	17.9			18.8773	58.5698
1155	17.9	18.7161	56.3498	18.6128	56.3682
1156	16.8	18.2691	55.9831	18.2051	56.0218
1157	14.2	−1.80371	−56.4954	−17.9611	−56.5070
1158	16.8	17.7108	52.7528	17.6451	52.7527
1159	15.5	17.2314	57.1600	17.1956	57.1752
1160	14.5	17.0108	54.3428	16.9491	54.3705
1161		16.9321	49.4358	16.8691	49.4452
1162	14.2	−16.8168	−52.5561	−16.7631	−52.5732
1163	17.9	16.7286	54.0951	16.6881	54.1142
1164	16.8	15.9904	50.7864	15.9526	50.8200
1165	13.5	15.5856	59.9561	15.5473	59.9657
1166	15.5	14.7444	59.3371	14.6726	59.3605
1167	16.8	−14.6156	−52.4608	−14.5713	−52.4772
1168	13.7	14.2956	57.2571	14.2293	57.2905

SECTION XIII. MEASURED COORDINATES

1169		−47.7113	−36.6086	−47.6545	−36.6720
1170	16.2	47.3409	39.4812	47.2970	39.5112
1171	16.8	46.5800	42.2664	46.5265	42.2862
1172	16.1	46.2007	36.1292	46.1632	36.1620
8	9.1	46.1552	46.0269	46.1158	46.0525
1173	14.9	−45.3057	−47.2726	−45.2572	−47.3042
1174	13.7	44.9275	39.6832	44.8800	39.7098
1175	16.8	44.8840	37.9444	44.8400	37.9895
1176	15.5	44.2207	44.4156	44.1788	44.4303
1177	14.7	42.9242	44.9019	42.8855	44.9290

TABLE 14

SECTION XII. REDUCED COORDINATES

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
1147	− 755.59	−2166.94	− 757.02	−2167.82	−1.43	−0.88
1148	748.83	2142.51	749.77	2144.32	−0.94	−1.81
1149	742.18	2132.56	743.79	2132.04	−1.61	+0.52
1150	740.42	1875.91	740.58	1876.01	−0.16	−0.10
1151	731.17	2134.78	732.38	2135.19	−1.21	−0.41
1152	− 730.05	−1966.18	− 730.47	−1966.65	−0.42	−0.47
1153	716.29	2243.80	717.06	2243.25	−0.77	+0.55
1154			716.87	2220.95		
1155	708.36	2137.83	706.81	2137.47	+1.55	+0.36
1156	691.41	2123.90	691.25	2124.32	+0.16	−0.42
1157	− 682.60	−2143.30	− 682.10	−2142.71	+0.50	+0.59
1158	670.30	2001.38	670.07	2000.35	+0.23	+1.03
1159	652.02	2168.44	653.07	2168.01	−1.05	+0.43
1160	643.71	2061.61	643.69	2061.66	+0.02	−0.05
1161	640.83	1875.57	640.60	1874.92	+0.23	+0.65
1162	− 636.39	−1993.86	− 636.51	−1993.51	−0.12	+0.35
1163	633.01	2052.20	633.79	2051.93	−0.78	+0.27
1164	605.08	1926.70	605.75	1927.01	−0.67	−0.31
1165	589.53	2274.33	590.48	2273.74	−0.95	+0.59
1166	557.64	2250.80	557.30	2250.76	+0.34	+0.04
1167	− 552.90	−1990.08	− 553.38	−1989.78	−0.48	+0.30
1168	540.66	2171.90	540.46	2172.26	+0.20	−0.36

SECTION XIII. REDUCED COORDINATES

1169	−1810.48	−1388.59	−1809.93	−1389.72	+0.55	−1.13
1170	1796.53	1497.55	1796.55	1497.43	−0.02	+0.12
1171	1767.74	1603.20	1767.51	1602.72	+0.23	+0.48
1172	1753.16	1370.41	1753.33	1370.41	−0.17	0.00
8	1751.73	1745.83	1752.17	1745.60	−0.44	+0.23
1173	−1719.55	−1793.08	−1719.69	−1793.10	−0.14	−0.02
1174	1704.97	1505.22	1704.88	1505.02	+0.09	+0.20
1175	1703.27	1439.26	1703.25	1439.76	+0.02	−0.50
1176	1678.30	1684.72	1678.59	1684.10	−0.29	+0.62
1177	1629.13	1703.16	1629.57	1703.05	−0.44	+0.11

TABLE 14

SECTION XIII. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
1178	17.9	−42.5530	−37.2462	−42.4995	−37.2658
1179	13.5	42.1720	36.2322	42.1332	36.2575
1180	14.2	42.1370	46.3092	42.0830	46.3262
1181	16.8	42.1290	40.2089	42.1072	40.2012
1182	14.2	41.6995	37.3472	41.6498	37.3742
1183	15.0	−41.2332	−44.1446	−41.2078	−44.1810
1184	13.3	40.2497	44.2274	40.2115	44.2562
1185	14.5	39.9270	45.8359	39.8865	45.8688
1186	16.2	39.3220	35.9592	39.2620	35.9752
1187	15.7	39.2575	43.1619	39.2018	43.1710
1188	16.2	−39.0087	−41.3659	−38.9618	−41.4055
1189	15.5	38.8580	35.2367	38.7638	35.2708
1190	17.9	38.5330	39.1146	38.4952	39.0742
1191	16.8	38.5127	38.3506	38.4688	38.3790
1192	14.7	38.4412	37.7934	38.3910	37.8040
1193	15.2	−38.4200	−44.1009	−38.3768	−44.1190
1194	19.0	38.2000	40.5329	38.1242	40.5525
1195	19.0	38.1500	39.9972	38.0662	39.9585
1196	14.9	38.0614	37.8429	38.0255	37.8910
1197	15.2	38.0612	46.0616	37.9950	46.0838
1198	14.2	−37.8407	−38.9459	−37.7940	−38.9722
1199	15.2	37.6880	43.7342	37.6460	43.7582
1200	19.0	37.5452	40.0912	37.5190	40.1275
1201	14.5	37.4920	43.0336	37.4405	43.0422
1202	19.0	36.5709	40.2776	36.5190	40.3128
1203	19.0	−36.2472	−39.8474	−36.2320	−39.8578
1204	14.5	36.0122	42.6396	35.9552	42.6888
1205	15.3	35.9882	43.6329	35.9385	43.6435
1206	14.7	35.9485	38.9916	35.9120	39.0245
1207	19.0	35.9385	40.2444	35.8485	40.2785
1208	19.0	−35.8742	−43.3056	−35.8005	−43.2982
1209	19.0	35.8657	39.5032	35.8162	39.5170
1210	19.0	35.8437	39.8907	35.8030	39.9382
1211	15.7	35.6445	44.7316	35.5820	44.7635
1212	19.0	35.4737	41.9629	35.4132	41.9460
1213	19.0	−35.4700	−39.3416	−35.4390	−39.2825
1214	15.7	35.4082	37.1569	35.3608	37.1790
1215	19.0	35.3630	43.5442	35.3208	43.5688
1216	15.7	35.2620	41.0432	35.2232	41.0638
1217	19.0	35.2530	41.6100	35.2245	41.5605

TABLE 14

SECTION XIII. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
1178	−1614.82	−1412.78	−1614.43	−1412.36	+0.39	+0.42
1179	1600.34	1374.32	1600.47	1374.12	−0.13	+0.20
1180	1599.31	1756.54	1599.22	1756.07	+0.09	+0.47
1181	1598.83	1525.16	1599.74	1523.72	−0.91	+1.44
1182	1582.45	1416.61	1582.20	1416.49	+0.25	+0.12
1183	−1564.96	−1674.44	−1565.88	−1674.71	−0.92	−0.27
1184	1527.66	1677.58	1528.09	1677.58	−0.43	0.00
1185	1515.46	1738.59	1515.87	1738.76	−0.41	−0.17
1186	1492.22	1363.97	1491.54	1363.47	+0.68	+0.50
1187	1489.99	1637.17	1489.72	1636.44	+0.27	+0.73
1188	−1480.49	−1569.05	−1480.50	−1569.47	−0.01	−0.42
1189	1474.59	1336.56	1472.59	1336.76	+2.00	−0.20
1190	1462.38	1483.65	1462.65	1481.04	−0.27	+2.61
1191	1461.59	1454.68	1461.61	1454.67	−0.02	+0.01
1192	1458.86	1433.54	1458.62	1432.86	+0.24	+0.68
1193	−1458.24	−1672.78	−1458.49	−1672.42	−0.25	+0.36
1194	1449.79	1537.45	1448.68	1537.13	+1.11	+0.32
1195	1447.88	1517.13	1446.44	1514.60	+1.44	+2.53
1196	1444.45	1435.42	1444.76	1436.17	−0.31	−0.75
1197	1444.69	1747.15	1444.14	1746.96	+0.55	+0.19
1198	−1436.11	−1477.26	−1436.05	−1477.19	+0.06	−0.07
1199	1430.46	1658.88	1430.75	1658.75	−0.29	+0.13
1200	1424.94	1520.70	1425.69	1521.02	−0.75	−0.32
1201	1423.01	1632.30	1422.91	1631.59	+0.10	+0.71
1202	1387.98	1527.77	1387.77	1528.07	+0.21	−0.30
1203	−1375.69	−1511.45	−1376.86	−1510.82	−1.17	+0.63
1204	1366.86	1617.36	1366.54	1618.22	+0.32	−0.86
1205	1365.98	1655.03	1365.97	1654.43	+0.01	+0.60
1206	1364.34	1478.99	1364.66	1479.21	−0.32	−0.22
1207	1363.99	1526.51	1362.34	1526.79	+1.65	−0.28
1208	−1361.65	−1642.62	−1360.71	−1641.34	+0.94	+1.28
1209	1361.21	1498.39	1361.06	1497.90	+0.15	+0.49
1210	1360.39	1513.09	1360.59	1513.88	−0.20	−0.79
1211	1352.98	1696.71	1352.52	1696.93	+0.46	−0.22
1212	1346.41	1591.69	1345.93	1590.05	+0.48	+1.64
1213	−1346.19	−1492.27	−1346.74	−1489.01	−0.55	+3.26
1214	1343.78	1409.40	1343.64	1409.22	+0.14	+0.18
1215	1342.26	1651.67	1342.54	1651.61	−0.28	+0.06
1216	1338.35	1556.81	1338.67	1556.59	−0.32	+0.22
1217	1338.03	1578.31	1338.75	1575.43	−0.72	+2.88

TABLE 14

SECTION XIII. MEASURED COORDINATES — CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
1218	19.0	−35.2370	−39.5022	−35.2835	−39.5388
1219	19.0	35.2365	−42.9726	35.2235	−42.9312
1220	16.8	35.1892	−45.3442	35.1485	−45.3370
1221		34.8945	−42.4376		
1222	16.8	34.1627	−43.7009	34.1080	−43.7438
1223	17.3	−33.7707	−42.8262	−33.7012	−42.8460
1224	16.8	33.3675	−43.4414	33.3102	−43.4415
1225	15.5	33.2617	−46.4892	33.2060	−46.4982
1226	12.6	33.2144	−36.7376	33.1808	−36.7530
1227	14.5	28.4954	− 3.1556	28.4690	− 3.1985
1228	16.8	−28.3897	− 2.0962	−28.3852	− 2.1278
1229	14.3	28.3662	+ 4.3501	28.3645	+ 4.3035
1230	15.7	27.4280	+ 3.5623	27.4118	+ 3.5225
1231	15.5	27.1747	− 4.8164	27.1570	− 4.8592
1232	17.9			26.7515	− 3.1445
1233	17.9	−26.6904	+ 5.7121	−26.6825	+ 5.6600
1234	19.0	26.5187	− 4.0044	26.5255	− 4.0168
1235	17.5	26.4614	− 1.8646	26.4382	− 1.9025
1236	19.0	26.2652	− 1.7782		
1237	13.9	25.6472	+ 7.9566	25.6352	+ 7.9050
1238	16.8	−25.6007	− 0.8242	−25.5945	− 0.8700
1239	13.5	25.3940	− 5.7799	25.3665	− 5.8095
1240	14.5	25.3544	− 7.0372	25.3335	− 7.0838
1241	16.2	25.1915	− 3.9696	25.1620	− 4.0210
1242	14.6			25.1140	+ 5.5532
1243	16.8	−24.1762	+ 9.3528	−24.1738	+ 9.3195
1244	16.8	24.7597	+ 6.4706	24.7702	+ 6.4438
1245	13.5	23.9097	+ 1.7081	23.8952	+ 1.6885
1246	15.7	23.8464	− 5.0379	23.8152	− 5.0928
1247	15.2	23.5547	+10.5366	23.5610	+10.4830
1248	16.8	−23.3187	+ 1.8543	−23.3240	+ 1.8068
1249	13.7	23.1872	+ 1.4198	23.1792	+ 1.3665
1250	17.1	23.0795	+ 3.6459	23.0685	+ 3.6138
1251	19.0	23.0642	+10.1583	23.0585	+10.1132
1252	16.2	22.9120	+ 5.4921	22.9020	+ 5.4482
1253	16.8	−22.7400	+ 6.0963	−22.7385	+ 6.0692
1254	16.8	22.6887	− 2.2429	22.6685	− 2.2902
1255	15.7	22.4324	+ 8.9318	22.4325	+ 8.8918
1256	14.2	22.3724	− 4.7344	22.3505	− 4.7675
1257	15.7	22.2877	− 7.1136	22.2538	− 7.1445

TABLE 14

SECTION XIII. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V − III	V − III
	″	″	″	″	″	″
1218	−1337.36	−1498.36	−1340.86	−1498.74	−3.50	−0.38
1219	1337.45	1629.99	1338.80	1627.43	−1.35	+2.56
1220	1335.72	1719.94	1336.12	1718.69	−0.40	+1.25
1221	1324.46	1609.70				
1222	1296.73	1657.61	1296.54	1658.28	+0.19	−0.67
1223	−1281.84	−1624.44	−1281.05	−1624.23	+0.79	+0.21
1224	1266.56	1647.77	1266.26	1646.82	+0.30	+0.95
1225	1262.64	1763.38	1262.51	1762.78	+0.13	+0.60
1226	1260.55	1393.50	1260.92	1393.11	−0.37	+0.39
1227	1080.53	119.73	1080.00	120.35	+0.53	−0.62
1228	−1076.49	− 79.55	−1076.75	− 79.73	−0.26	−0.18
1229	1075.40	+ 164.96	1075.55	+ 164.23	−0.15	−0.73
1230	1039.84	+ 135.07	1039.46	+ 134.59	+0.38	−0.48
1231	1030.48	− 182.73	1030.34	− 183.37	+0.14	−0.64
1232			1014.85	− 118.33		
1233	−1011.79	+ 216.62	−1011.66	+ 215.66	+0.13	−0.96
1234	1005.57	− 151.93	1006.33	− 151.43	−0.76	+0.50
1235	1003.33	− 70.77	1002.89	− 71.23	+0.44	−0.46
1236	995.89	− 67.49				
1237	972.15	+ 301.75	971.79	+ 300.80	+0.36	−0.95
1238	− 970.65	− 31.31	− 970.81	− 32.08	−0.16	−0.77
1239	962.96	− 219.28	962.49	− 219.46	+0.47	−0.18
1240	961.49	− 266.97	961.32	− 267.80	+0.17	−0.83
1241	955.22	− 150.61	954.61	− 151.62	+0.61	−1.01
1242			952.17	+ 211.57		
1243	− 916.31	+ 354.71	− 916.26	+ 354.42	+0.05	−0.29
1244	938.53	+ 245.38	939.07	+ 245.35	−0.54	−0.03
1245	906.43	+ 64.74	906.19	+ 64.94	+0.24	+0.20
1246	904.23	− 191.13	903.60	− 192.30	+0.63	−1.17
1247	892.69	+ 399.61	892.94	+ 398.55	−0.25	−1.06
1248	− 884.00	+ 70.29	− 884.52	+ 69.42	−0.52	−0.87
1249	879.03	+ 53.81	879.05	+ 52.71	−0.02	−1.10
1250	874.87	+ 138.23	874.71	+ 137.96	+0.16	−0.27
1251	874.10	+ 385.26	873.90	+ 384.51	+0.20	−0.75
1252	868.47	+ 208.39	868.27	+ 207.54	+0.20	−0.85
1253	− 861.92	+ 231.19	− 862.03	+ 231.09	−0.11	−0.10
1254	860.23	− 85.12	859.92	− 86.01	+0.31	−0.89
1255	850.17	+ 338.74	850.24	+ 338.16	−0.07	−0.58
1256	848.30	− 179.62	848.02	− 179.99	+0.28	−0.37
1257	845.16	− 269.87	844.50	− 270.17	+0.66	−0.30

TABLE 14

SECTION XIII. MEASURED COORDINATES—CONTINUED

NO.	MAG.	PLATE III		PLATE V	
		x	y	x	y
		r	r	r	r
1258	14.7	−22.2835	+ 9.6284	−22.2695	+ 9.5908
1259	16.8	22.1237	− 2.3642	22.1225	− 2.4075
1260	18.4	21.9364	+ 0.0103	21.9160	− 0.0392
1261	16.2	21.6600	+ 2.7953	21.6295	+ 2.7712
1262	16.2	21.2755	+ 6.2578	21.2908	+ 6.2182
1263	18.4	−21.2484	+ 3.7762	−21.2370	+ 3.7418
1264	15.7	21.1164	+ 2.1018	21.1062	+ 2.0502
1265	13.1	20.9080	− 5.6546	20.8800	− 5.6958
1266	16.2	20.8277	+ 6.0876	20.8208	+ 6.0335
1267	14.4	20.0727	+ 6.7321	20.0332	+ 6.7012
1268	17.5	−19.2957	+ 3.3471	−19.3310	+ 3.3415
1269	15.5	19.2374	+ 6.7078	19.2320	+ 6.6440
1270	15.1	19.1742	− 1.9646	19.1422	− 1.9955
1271	14.7	18.9390	+ 4.3736	18.9272	+ 4.3450
1272	17.1	18.6597	+ 2.8116	18.6570	+ 2.7542

TABLE 14

SECTION XIII. REDUCED COORDINATES — CONTINUED

NO.	PLATE III		PLATE V		V_X	V_Y
	X	Y	X	Y	V−III	V−III
	″	″	″	″	″	″
1258	− 844.50	+ 365.16	− 844.01	+ 364.67	+0.49	−0.49
1259	838.80	− 89.72	839.22	− 90.48	−0.42	−0.76
1260	831.62	+ 0.34	831.23	− 0.64	+0.39	−0.98
1261	821.05	+ 105.98	820.18	+ 105.96	+0.87	−0.02
1262	806.36	+ 237.31	807.11	+ 236.72	−0.75	−0.59
1263	− 805.41	+ 143.18	− 805.23	+ 142.77	+0.18	−0.41
1264	800.45	+ 79.67	800.37	+ 78.60	+0.08	−1.07
1265	792.78	− 214.53	792.30	− 215.24	+0.48	−0.71
1266	789.38	+ 230.86	789.29	+ 229.70	+0.09	−1.16
1267	760.72	+ 255.30	759.37	+ 255.01	+1.35	−0.29
1268	− 731.35	+ 126.91	− 732.95	+ 127.55	−1.60	+0.64
1269	729.03	+ 254.38	728.98	+ 252.82	+0.05	−1.56
1270	726.90	− 74.57	726.14	− 74.91	+0.76	−0.34
1271	717.78	+ 165.84	717.57	+ 165.61	+0.21	−0.23
1272	707.24	+ 106.60	707.43	+ 105.26	−0.19	−1.34

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